



Agriculture & Horticulture
DEVELOPMENT BOARD



Grower Summary

SF 012 (GSK215)

Blackcurrants: Further detailed evaluation of new cultivars from the breeding programme for evenness of bud break and development

Final 2007

Disclaimer

AHDB, operating through its HDC division seeks to ensure that the information contained within this document is accurate at the time of printing. No warranty is given in respect thereof and, to the maximum extent permitted by law the Agriculture and Horticulture Development Board accepts no liability for loss, damage or injury howsoever caused (including that caused by negligence) or suffered directly or indirectly in relation to information and opinions contained in or omitted from this document.

No part of this publication may be reproduced in any material form (including by photocopy or storage in any medium by electronic means) or any copy or adaptation stored, published or distributed (by physical, electronic or other means) without the prior permission in writing of the Agriculture and Horticulture Development Board, other than by reproduction in an unmodified form for the sole purpose of use as an information resource when the Agriculture and Horticulture Development Board or HDC is clearly acknowledged as the source, or in accordance with the provisions of the Copyright, Designs and Patents Act 1988. All rights reserved.

AHDB (logo) is a registered trademark of the Agriculture and Horticulture Development Board. HDC is a registered trademark of the Agriculture and Horticulture Development Board, for use by its HDC division. All other trademarks, logos and brand names contained in this publication are the trademarks of their respective holders. No rights are granted without the prior written permission of the relevant owners.

The results and conclusions in this report may be based on an investigation conducted over one year. Therefore, care must be taken with the interpretation of the results.

Use of pesticides

Only officially approved pesticides may be used in the UK. Approvals are normally granted only in relation to individual products and for specified uses. It is an offence to use non-approved products or to use approved products in a manner that does not comply with the statutory conditions of use, except where the crop or situation is the subject of an off-label extension of use.

Before using all pesticides check the approval status and conditions of use.

Read the label before use: use pesticides safely.

HDC is a division of the Agriculture and Horticulture Development Board.

Project Number: SF 012 (GSK215)

Project Title: Blackcurrants: Further detailed evaluation of new cultivars from the breeding programme for evenness of bud break and development

Project Leader: John Atwood, ADAS UK Ltd

Contractor/(s): ADAS UK Ltd

Report: Final, September 2007

Publication Date: 25/06/2014

Previous report/(s): None

Start Date: 01 March 2007

End Date: 15 September 2007

Further information

If you would like a copy of this report, please email the HDC office (hdc@hdc.ahdb.org.uk), alternatively contact the HDC at the address below.

HDC,
AHDB
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

Tel – 0247 669 2051

GROWER SUMMARY

Headlines

- Following detailed analysis of bud development on cultivars at the two GSK observation sites a quantitative method for ranking evenness is proposed.
- Based on this method the new cultivars Ben Klibrek, Tiben, 91192-1 and 9134-7 could be ranked as “good” and the cultivars, 9199-4, 934-60, 934-74, 938-56, 9311-25, 9311-66, 9311-82 could be ranked as “poor” alongside Ben Alder and Ben Lomond. Others were intermediate.

Background and expected deliverables

A number of commercial blackcurrant cultivars are known to have a significant winter chill requirement to enable even bud-break and uniform ripening. The 2006/7 winter was unusually mild, resulting in shortfall in the chill requirement for many of the current commercial cultivars.

In order to provide more information on the performance of new cultivars following a winter with low levels of chilling, detailed records of bud development and fruit ripening were taken in 2007 at the two cultivar observation sites, at Newent, Glos. and Bradenham, Norfolk, to provide accurate information for evenness ranking. Such information will be important in deciding on the suitability of new cultivars in areas prone to mild winters.

Summary of the project and main conclusions

The two established cultivar observation sites were used for the evaluation.

The Bradenham site comprised ten 50 m single rows, each with one cultivar planted in spring 2002-03. The Newent site comprised twenty four 60-80 m single rows, each with one cultivar planted from spring 2000-03.

Whilst the bushes were still dormant (early March) 10 shoots were selected within each cultivar row and monitored weekly. As soon as some buds were at the B1 growth stage (see Glossary for a list of growth stage codes) the growth stage of each of the top 13 buds on

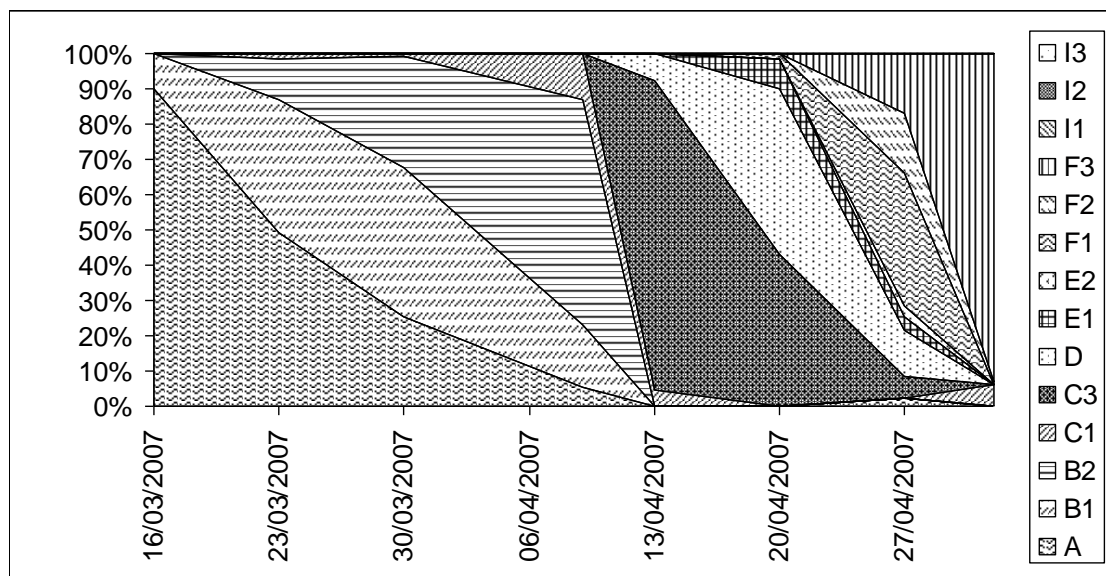
each observed shoot was recorded weekly until the overall growth stage was assessed as F3 (100% flowers open). The final recordings were made at the end of May.

Seven days prior to harvest the numbers of black, red and green berries were recorded for each of the 13 bud nodes on the tagged shoots.

The earliest cultivars started to break bud on 8 March. The number of accumulated winter chill units (accumulated h < 7°C) from 1 October 2006 to 8 March 2007 was 1434 h at Bradenham and 1212 h at Newent. The late cultivars broke bud on 10 April at Bradenham (1806 h) and on 30 March at Newent (1463 h). The average chill unit requirement for cultivars ranges from 1320 h up to 2366 h. So for many cultivars it is likely that the normal chill requirement would not have been fully met following the winter of 2006/07, the deficit being particularly acute at Newent.

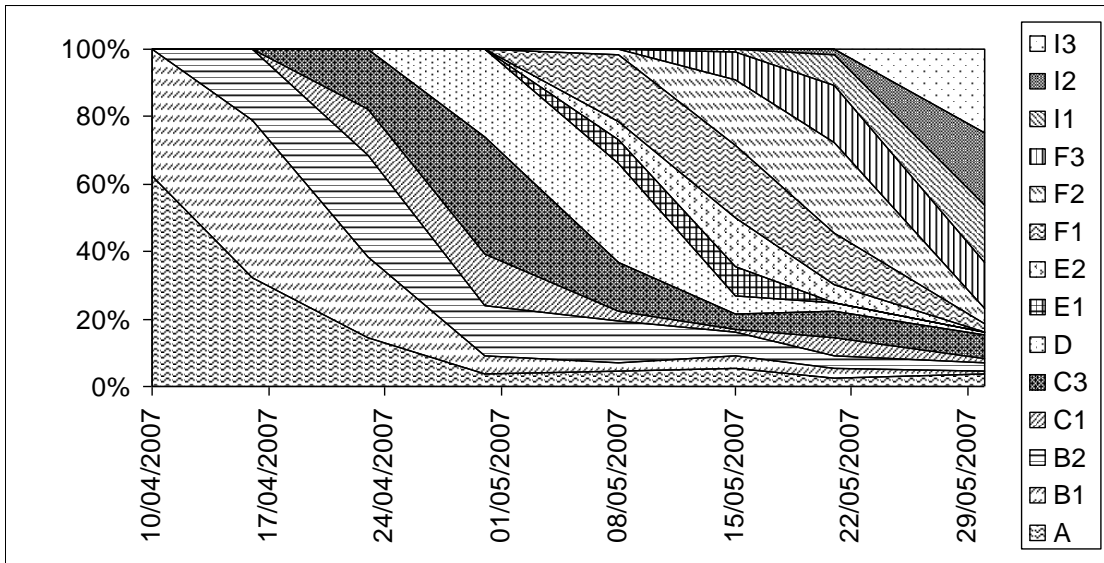
Cultivars varied considerably in the evenness of development, with some (e.g. Ben Klibrek) passing through growth stages uniformly (Figure 1).

Figure 1. Bud development Newent, for cv. Ben Klibrek: percentage of buds at each growth stage from mid-March to early-May.



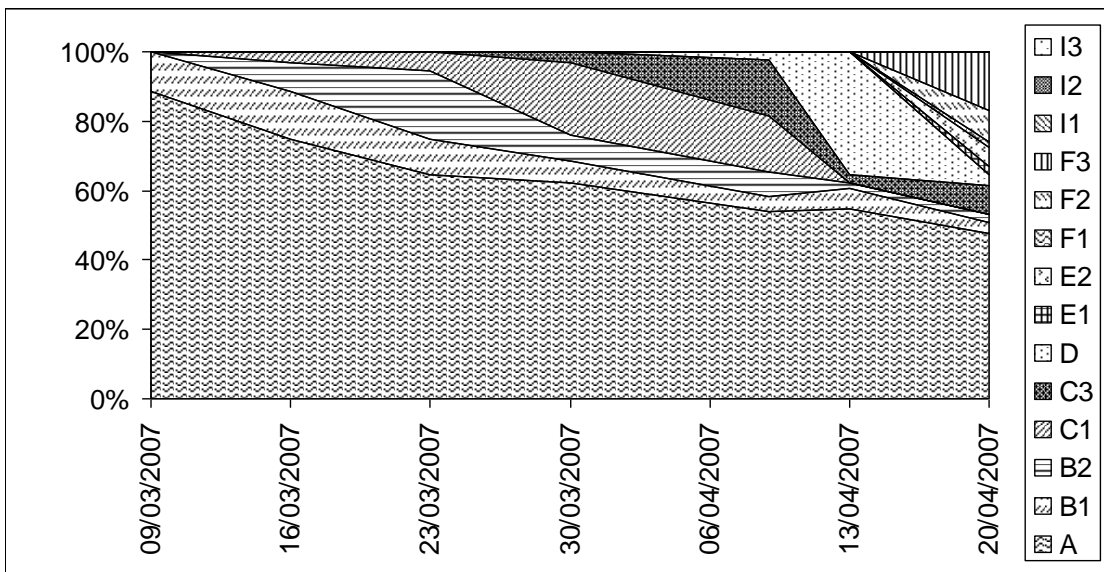
Others (e.g. Ben Alder) had buds at many different stages of development, particularly at flowering (Figure 2).

Figure 2. Bud development Bradenham, for cv Ben Alder percentage of buds at each growth stage from mid-April to end-May.



Another characteristic of these unevenly developing cultivars was the presence of a significant percentage of dormant buds throughout the recording period. This was particularly evident at Newent where the level of winter chill was much less than at Bradenham. One of the worst cultivars for buds remaining dormant was 9311-66 with 50% of buds dormant at the end of the recording period (Figure 3).

Figure 3. Bud development Newent for cv 9311-66 percentage of buds at each growth stage from mid-March to end-April.



In order to quantify the uniformity of bud development, the data were further analysed by allocating a numeric value to each growth stage and calculating the standard deviation (a statistical measure of variability) of the values. This data were used to provide a ranking of uniformity for cultivars based on the mean of the standard deviation of growth stage scores at growth stages F1-F3 (Table 1).

Because Newent provides the most complete data set and the more challenging environment for winter chill, the cultivars are ranked in order of their performance at Newent. Bud development was noticeably more even at Bradenham with most cultivars with acceptable evenness. The two exceptions were S36-1-21 and Ben Alder, and both had relatively high variability at both sites. Surprisingly, S36-1-21 performed slightly better at Newent. There were some other inconsistencies between the rankings at the two sites. Baldwin and 91129-1 were more variable at Bradenham than at Newent and the evenness of 9199-4 was moderate at Bradenham but very poor at Newent largely due to 30% of buds remaining dormant throughout the recording period.

Table 1: Mean standard deviation of growth stage scores at F1 – F3 growth stage, and uniformity rating

Cultivar	Uniformity rating	Mean standard deviation of growth stage scores	
		Newent	Bradenham
Ben Klibrek	Good	1.91	-
Tiben		2.37	0.73
91192-1		2.45	2.72
Baldwin		2.58	2.88
9134-7		2.77	0.59
9148-9	Moderate – Good	3.1	-
B. Hope		3.12	0.79
9154-3		3.21	1.15
Ben Gairn		3.24	-
9137-2	Moderate – Poor	3.43	-
9111-14		3.44	-
S36-1-21		3.47	3.71
91129-1		3.59	2.51
9198-1		3.59	-
934-58		3.67	-
934-60	Poor	4.05	-
Ben Alder		4.05	3.17
Ben Lomond		4.14	-
9311-66		4.16	-
9311-25		4.39	-
9199-4		4.44	2.09
9311-82		4.65	-
934-74		4.77	-
938-56	4.78	-	

The cultivar Ben Klibrek has recently been named and is being multiplied up for release. At both sites where it has been grown in 2007 it has produced high yields, generally better than existing commercial cultivars. Cultivar 9134-7 has similarly performed well with good agronomic characteristics. Tiben is unlikely to be progressed due to processing considerations and 91129-1 is, unfortunately, very slow growing and the results at Bradenham were more variable. Cultivars 9148-9 and 9154-3 also showed some promise in uniformity characteristics. Cultivar 9148-9 in has good agronomic characteristics but 9154-3 has produced disappointingly poor fruit quality to date.

Cultivars in the “moderate-poor” category should not be dismissed at this stage as the work so far is based on one season’s results and for some of the cultivars, results from only one site.

Records were also taken of fruit colour 7 days prior to harvest. Although the uniform development of fruit colour should be related to bud development uniformity, other factors come into play. These include; the bush habit and the relative exposure of the fruit, the loss of overripe fruit prior to harvest and the ability of the ripe fruit to “hang” whilst under-ripe fruit ripens.

The cultivars that had noticeably variable fruit colour (<96% black) included S36-1-21, 9137-2, 9148-9, 9198-1, Ben Alder and Ben Lomond. Of these Ben Alder was the most variable at both sites.

Financial benefits

The 2007 cropping season has shown that a lack of winter chilling can result in a yield loss of 50% for the worst affected cultivars, reducing yield from 10 tonnes/ha to 5 tonnes/ha. The cost could therefore amount to 5 tonnes/ha or £3200 per ha.

By the correct choice of cultivars for the site, growers may be able to achieve more consistent results in mild winters.

Action points for growers

- Ben Klibrek, Tiben, 91192-1 and 9134-7 showed very good uniformity characteristics in a season with low chill levels.
- Cultivars 9148-9 and 9154-3 showed some promise in uniformity characteristics.
- Ben Klibrek also has good agronomic characteristics and is already being bulked up for release to the industry. It appears to be suitable for planting in low chill situations.
- Cultivars 9134-7 and 9148-9 have some good agronomic characteristics and might be considered for fast track release to the industry for use in low chill situations. However 9148-9 is only suitable for sites with a low risk of gall mite and reversion.