Grower Summary

SF 012 (GSK220)

Blackcurrants: Assessment of fungicides for the control of latent botrytis in fruit

Final 2009

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

Read the label before use: use pesticides safely.

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Contractor/(s):	ADAS UK Ltd
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Further information

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GROWER SUMMARY

Headline

- Bayer UKA386 was the most effective treatment in reducing latent *Botrytis*. Signum and Bayer UKA386 were the most effective fungicides for the control of post-harvest rots *Botrytis*, *Mucor* and *Penicillium*.

Background and expected deliverables

Botrytis is an important disease of blackcurrants causing flower run-off and contamination pre and post-harvest. Yield losses can range from 15 to 50% and latent *Botrytis* infection particularly in the cultivar Ben Hope is believed to have been responsible for severe processing problems for GSK. In most cases these problems were not apparent at the time of harvest. Latent *Botrytis* is an internal infection within the berry that has not yet caused a rot but may have the capability of doing so if conditions are favourable. Ben Hope is thought to be less susceptible to *Botrytis* induced flower run-off than Baldwin, making latent *Botrytis* a significant risk.

The last *Botrytis* fungicide screening on blackcurrants was carried out 5 years ago (Atwood 2004) (SF12, 195), but latent *Botrytis* infection was not specifically studied. Since that time, newer fungicides have become available with potential for *Botrytis* control. It is essential to have a range of fungicides available for *Botrytis* control with different modes of action to combat the development of resistance.

The objectives and deliverables of the project were to:

- Evaluate a range of new fungicides for *Botrytis* control, both latent and expressed, pre and post-harvest.
- Quantify the yield response from a range of fungicides used for *Botrytis* control.
- Evaluate any incidental control of leaf spot (*Drepanopeziza ribis*) and post- harvest *Mucor, Rhizopus* or *Penicilliium* resulting from the use of fungicides when used in a *Botrytis* control programme.

Summary of the project and main conclusions

A range of fungicides (Table 1) was applied either in a repeated three spray programme or as an alternating programme (Table 2) to a mature plantation of blackcurrants cv. Ben Hope.

Table 1. Product details

Product	Active ingredient(s)	Rate of use	Approval status
Bayer UKA386	Not disclosed	0.8 L/ha	Experimental
Bravo 500	Chlorothalonil (500 g/l)	3.0 L/ha	On-label approval
Serenade	Bacillus subtilis	10 L/ha	On-label approval
Signum	Boscalid (26.7% w/w) + pyraclostrobin (6.7% w/w)	1.5 kg/ha	SOLA
Stroby WG	kresoxim-methyl 50% w/w	0.2 kg/ha	On-label approval
Switch	cyprodinil 37.5 % + fludioxonil 25% w/w	1.0 kg/ha	On-label approval
Teldor	fenhexamid 50 % w/w	1.5 kg/ha	On-label approval

Table 2. Treatment programmes

Treatment No.	1st flower 16/4/09	Mid-end flower 26/4/09	1st set 10/5/09	100% set 21/5/09
1.	Nil	Nil	Nil	Nil
2.	Bayer UKA386	Bayer UKA386	Bayer UKA386	Nil
3.	Serenade	Serenade	Serenade	Nil
4.	Signum	Signum	Signum	Nil
5.	Stroby WG	Stroby WG	Stroby WG	Nil
6.	Switch	Switch	Switch	Nil
7.	Teldor	Teldor	Teldor	Nil
8	Bravo 500	Signum	Bravo 500	Nil
9.	Bravo 500	Signum	Bravo 500	Signum

Significant levels of latent *Botrytis* were found in samples of unripe berries when analysed in June (Fig. 1).

Most of the treatments tested significantly reduced latent *Botrytis* from 66.7% in the untreated control, but levels remained quite high at around 42-53%. Bayer UKA386 however

stood out as the most effective treatment, substantially reducing latent *Botrytis* infection in the unripe fruit to around 16%. Signum was the most effective of the other treatments reducing levels to around 42%.

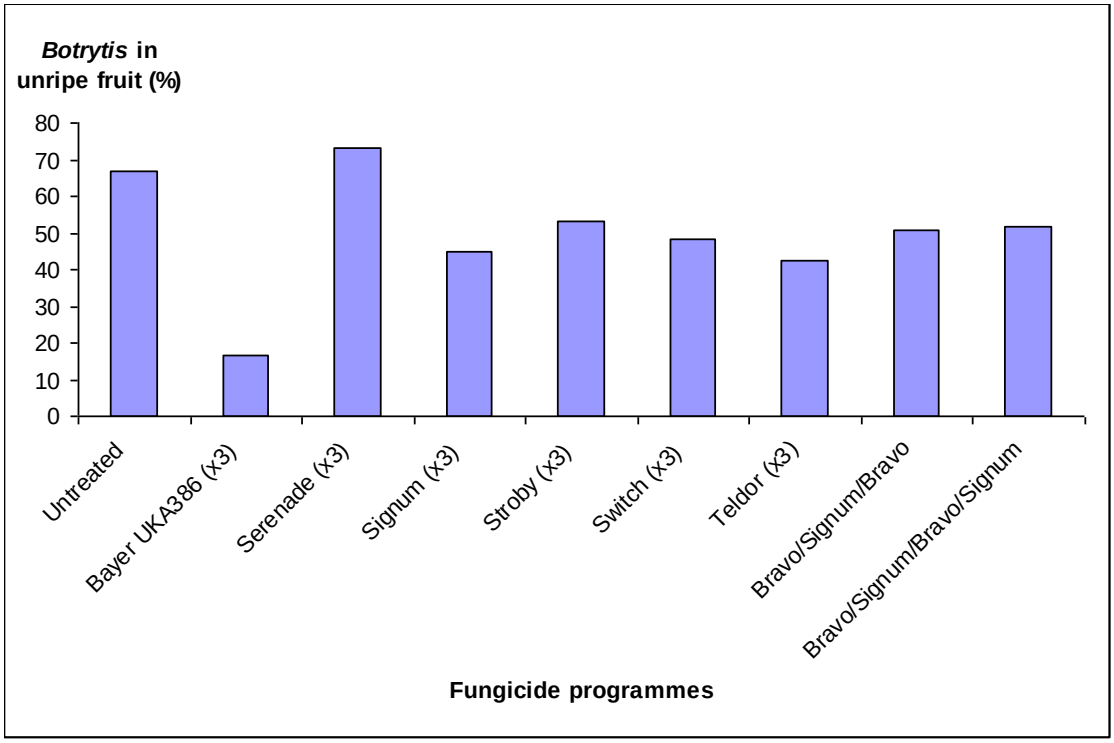

Figure 1. Percentage of unripe fruit with latent *Botrytis* infection

Levels of visible infection in the ripe fruit at harvest were lower but still rather higher than would be acceptable for a commercial crop (Fig. 2). Bayer UKA386 also appeared to give good control of *Botrytis* both in the fresh harvested fruit (Fig. 2) and in the incubated fruit although these results were only significant at the 7.5% probability level. Similarly Signum performed well and in addition gave some control of *Mucor*.

Bayer UKA386 and Signum treatments had the least rots from *Botrytis, Mucor* and *Penicilium* after incubation (Fig. 3). *Rhizopus* was not detected.

Of the other treatments Serenade was relatively ineffective, the only significant result being a small reduction in *Botrytis* infection in the bush. Stroby WG and Bravo 500 (when used as an alternating programme with Signum) were less effective than other treatments when comparing levels of *Botrytis* in the bush. A similar trend was apparent in the fruit *Botrytis* assessments but differences were not statistically significant.

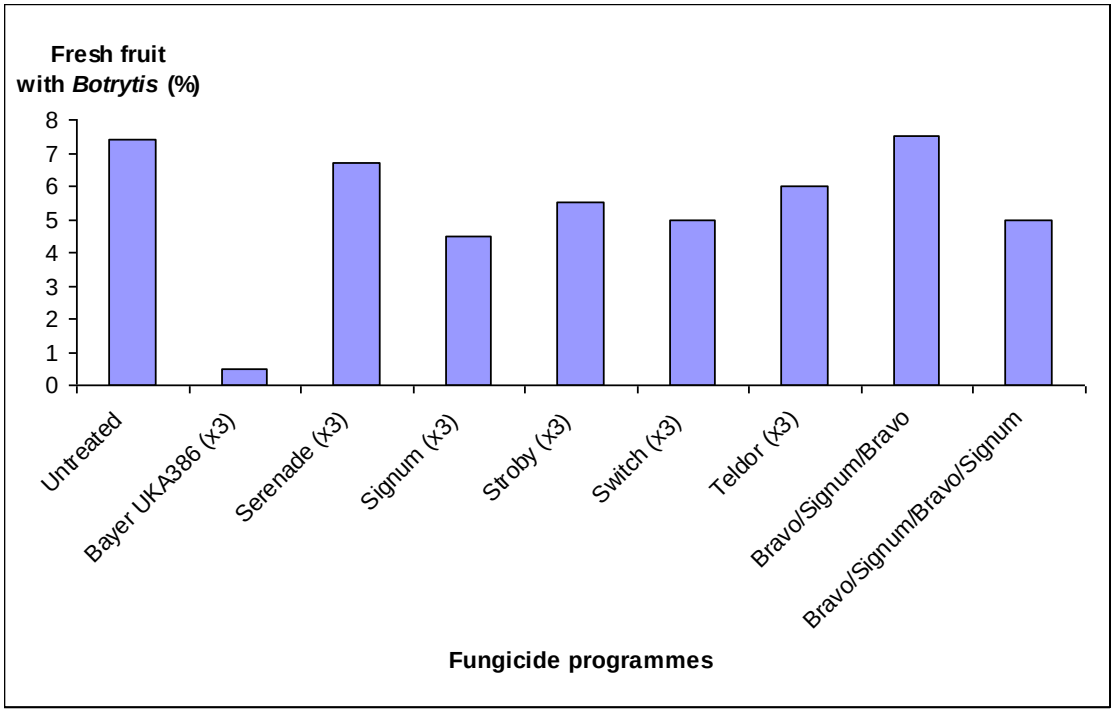

Figure 2. Percentage of fresh fruit with *Botrytis* infection

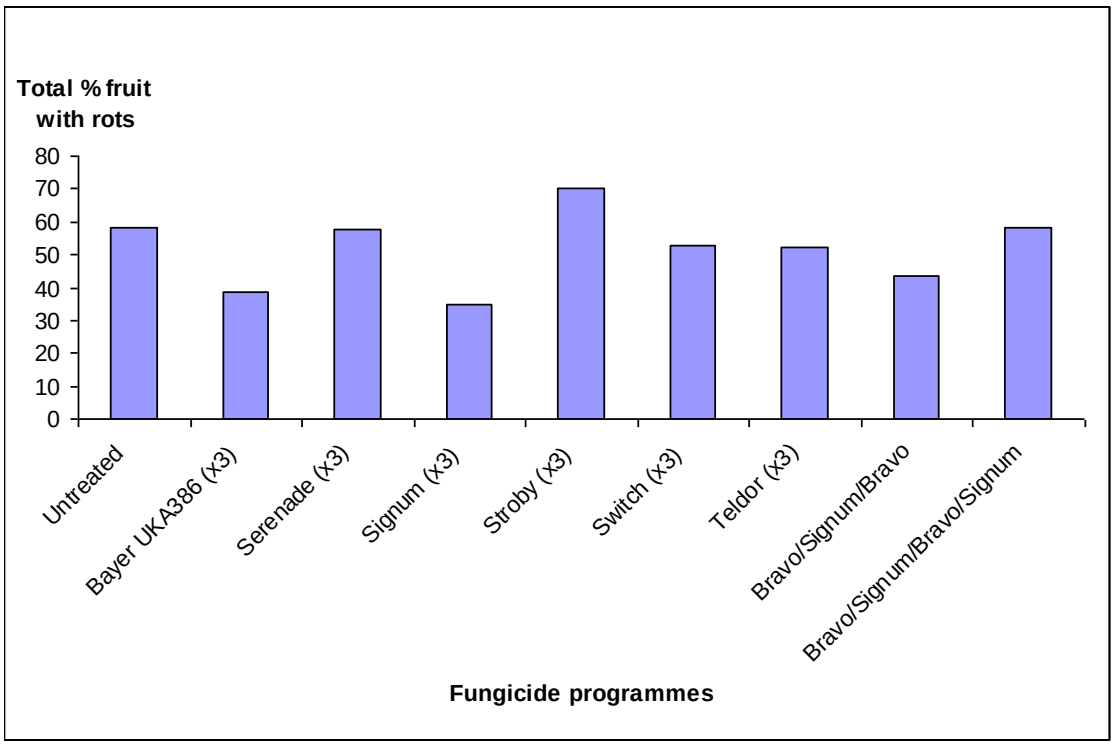

Figure 3. Total percentage of incubated fresh fruit with rots.

Apart from the Bravo/Signum programme only three fungicide applications were made and the spray interval between the second and third application may have been too long to achieve the best level of control. Bayer UKA386 and, to some extent, Signum performed

well despite this, but the other fungicides would probably need to be applied more frequently to achieve a commercially acceptable level of control.

Bayer UKA386 is not yet available. Signum is the most effective currently available fungicide. This result confirms previous findings (Atwood 2004) (SF 12 project 194), but, to avoid the development of resistant *Botrytis*, Signum would need to be used in a programme with other fungicides. The next most effective fungicides are Switch or Teldor and either could be used in an alternating programme.

Bayer UKA386, Signum and Bravo 500 all gave excellent control of leaf spot; Switch and Stroby WG had moderate activity but Teldor, and Serenade had no effect

All treatments improved fruit set compared with the untreated. Although there were no significant differences in fruit set between the fungicides there was an indication that Signum had the most effect. All fungicide treatments except Serenade appeared to increase yields but differences were not statistically significant.

Financial benefits

It was not possible to demonstrate a significant yield response from the fungicide treatments but fruit quality is becoming more important than yield. Results indicate that Bayer UKA386 has the best potential to reduce latent *Botrytis* infection. Bayer UKA386 is not yet available so any financial benefits from this aspect of the research will not be realised until it is available with approval for use on Blackcurrants. Of the currently available products, Signum was the most effective fungicide for control of *Botrytis* and other rots in the fruit. The use of the best possible fungicide programme for *Botrytis* control avoids the risk of crop rejection by the processors at a potential cost of £6500/ha assuming a 10 t/ha crop at £650 / tonne.

Action points for growers

- When available and approved, Bayer UKA386 should be included in the fungicide programme for *Botrytis* and leaf spot control.
- Signum is the most effective currently available fungicide for *Botrytis* control and also offers excellent control of leaf spot.
- Teldor or Switch are suitable alternatives for use in a programme as an anti-resistance strategy.
- Bravo 500 and Stroby WG were less effective as *Botrytis* fungicides and should not be relied upon solely for *Botrytis* control during flowering and early fruit set when the risk of infection is greatest.