Project title:	Effects of sulphur on levels of big bud mite and yields in three varieties of blackcurrant
Project number:	SF 12 (174)
Project Leader:	Farm Advisory Services Team Ltd
Location:	Highland Court Farm, Bridge, Canterbury Hamrow Farm, Whisonett, Norfolk
Keywords:	blackcurrant, sulphur, Ben Lomond, Ben Alder, Ben Tirran, big bud

Objective

To provide support in collection of data from two trials to assess the affect of sulphur in commercial Blackcurrant production.

Treatments

The fields were divided into four plots and treatments were applied to three varieties. Sites were at Highland Court Farm, Bridge, Canterbury and Hamrow Farm, Whisonsett, Norfolk.

Up to six sprays to control big bud were applied between first leaf emergence and fruit set.

Timings

Spray 1 – all varieties when Ben Lomond at leaf emergence
Spray 2 – Ben Alder and Tirran only – 2 to 3 weeks after spray 1.
Spray 3 – when each variety at early grape.
Spray 4 – when each variety at first open flower.
Spray 5 – when each variety at final open flower.
Spray 6 (optional) Ben Lomond and Baldwin only when each variety reaches fruit set.

Materials

Spray No	Plot 1	Plot 2	Plot 3	Plot 4 Control
1	S	S	S	M or T
2	S	S	M	M or T
3	S	M or T	M or T	M or T
4	M or T	M or T	M or T	M or T
5	M or T	M or T	M or T	M or T

Assessments

Twenty bushes were selected at random from a row down the middle of each plot and the number of big buds was counted on each bush before bud burst and again after leaf fall.

Growers records of yields were collected for each plot.

Results

Levels of Big bud

The Ben Tirran at Highland Court Farm was severely infested with some bushes having over 200 infected buds per bush. Numbers of big buds on the other plots at Highland Court and all the plots at Hamrow were much lower averaging below 0.5 buds per bush.

Table 1 Big bud levels at Highland Court early season

	Ben Alder	Ben Lomond	Ben Tirran
Plot 1 mean	0	0.05	41.85
range	*0*	*0-1*	*9-88*
Plot 2 mean	0.1	0.35	93.15
range	*0-1*	*0-1*	*24-177*
Plot 3 mean	0.05	0	88.8
range	*0-1*	*0*	*22-208*
Plot 4 mean	0.4	0.5	82.15
range	*0-6*	*0-3*	*21-170*

Table 2 Big bud levels at Hamrow Farm early season

	Ben Alder	Ben Lomond	Ben Tirran
Plot 1 mean	0	0	0.75
range	*0*	*0*	*0-4*
Plot 2 mean	0.05	0	0.4
range	*0-1*	*0*	*0-2*
Plot 3 mean	0	0	0.05
range	*0*	*0*	*0-1*
Plot 4 mean	0.05	0.5	0.05
range	*0-1*	*0-2*	*0-1*

Table 3 Levels of Big bud at Highland Court end of season

	Ben Alder	Ben Lomond	Ben Tirran

Plot 1 mean ***range***	0 *0*	0.05 *0-1*	34.1 *13-83*
Plot 2 mean ***range***	0 *0*	0.3 *0-3*	46.15 *17-180*
Plot 3 mean ***range***	0.05 *0-1*	0 *0*	36.75 *16-76*
Plot 4 mean ***range***	0.25 *0-3*	0.3 *0-1*	24.05 *10-35*

Table 4 Levels of Big bud at Hamrow Farm end of season

	Ben Alder	**Ben Lomond**	**Ben Tirran**
Plot 1 mean ***range***	0 *0*	0 *0*	0.2 *0-1*
Plot 2 mean ***range***	0.2 *0-1*	0 *0*	0.45 *0-3*
Plot 3 mean ***range***	0.1 *0-1*	0 *0*	0.15 *0-3*
Plot 4 mean ***range***	0.35 *0-3*	0 *0*	0.3 *0-3*

Effect of treatments on the reduction of big bud.

Tables 5 & 6 show how effective the treatments were at reducing the levels of big bud during the season. In the heavily infested Ben Tirran bushes at Highland Court the best reduction was in the control treatment ie no Sulphur. In all other plots where initial levels of big bud were very low the sulphur treatments were equally or more effective than the control at keeping infestation under control.

Table 5 Effect of treatments on reduction of big bud numbers Highland Court Farm

		Mean no. big buds per bush		Difference	% of Spring level	Mean
Treatment	Variety	Spring	Autumn			
Plot 1	Ben Alder	0	0	0	0.0	
Plot 1	Ben Lomond	0.05	0.05	0	0.0	
Plot 1	Ben Tirran	41.85	34.1	-7.75	81.5	27.2

Plot 2	Ben Alder	0.1	0	-0.1	0.0	
Plot 2	Ben Lomond	0.35	0.3	-0.05	0.0	
Plot 2	Ben Tirran	93.15	46.15	-47	49.5	16.5
Plot 3	Ben Alder	0.05	0.05	0	0.0	
Plot 3	Ben Lomond	0	0	0	0.0	
Plot 3	Ben Tirran	88.8	36.75	-52.05	41.4	13.8
Control	Ben Alder	0.4	0.25	-0.15	62.5	
Control	Ben Lomond	0.5	0.3	-0.2	0.0	
Control	Ben Tirran	82.15	24.05	-58.1	29.3	30.6

Table 6 Effect of treatments on reduction of big bud numbers Hamrow Farm

		Mean no. big buds per bush		Difference	% of Spring level	Mean
Treatment	Variety	Spring	Autumn			
Plot 1	Ben Alder	0	0	0	0.0	
Plot 1	Ben Lomond	0	0	0	0.0	
Plot 1	Ben Tirran	0.75	0.2	-0.55	26.7	8.9
Plot 2	Ben Alder	0.05	0.2	0.15	400.0	
Plot 2	Ben Lomond	0	0	0	0.0	
Plot 2	Ben Tirran	0.4	0.45	0.05	112.5	170.8
Plot 3	Ben Alder	0	0.1	0.1	0.0	
Plot 3	Ben Lomond	0	0	0	0.0	
Plot 3	Ben Tirran	0.05	0.15	0.1	300.0	100.0
Control	Ben Alder	0.05	0.35	0.3	700.0	
Control	Ben Lomond	0	0	0	0.0	
Control	Ben Tirran	0.05	0.3	0.25	600.0	433.3

Effect of treatments on yields

At Highland Court the lowest yielding plots were the control plots and no yield reduction could be attributed to the sulphur treatments.

Table 7

Variety Pick date	Ben Lomond 19.07.00	Percentage of Control	Ben Alder 02.08.00	Percentage of Control	Ben Tirran 09.08.00	Percentage of Control
Plot 1	687.0	103.5	690.0	170.6	1804.0	132.3

Plot 2	776.0	116.9	478.5	118.3	1601.0	117.4
Plot 3	705.0	106.2	389.5	96.3	1492.0	109.4
Plot 4	664.0	100.0	404.5	100.0	1363.5	100.0

At Hamrow Farm Ben Lomond yields were slightly reduced in the sulphur plots (plots 1, 2 & 3) but Ben Alder yields were very similar or higher in the sulphur plots.

Table 8

Variety Pick date	Ben Lomond 19.07.00	Percentage of Control	Ben Alder 02.08.00	Percentage of Control	Ben Tirran 09.08.00	Percentage of Control
Plot 1	1498.0	88.4	1904.0	98.0	n/a	
Plot 2	1611.0	95.0	2019.0	103.9	n/a	
Plot 3	1465.0	86.4	2293.0	118.0	n/a	
Plot 4	1695.0	100.0	1943.0	100.0	n/a	

Summary & Discussion

The treatments were applied on a commercial scale using standard spray equipment, and provide an interesting comparison to small scale scientific trial plots.

The trial has shown that generally there appears to be little risk of yield reduction when using sulphur.

Sulphur is equally effective as standard treatments in maintaining or reducing low levels of infection but in severely infested areas the Meothrin and Thiodan gave better control.