CULTAR FOR THE CONTROL OF VIGOROUS VARIETIES NACM 98/5/1

Objective:Encourage balanced growth and early cropping in trees of the vigorous varieties Major and Ellis Bitter and in strongly growing trees of Ashton Bitter and Dabinett.

Site: H P Bulmer's Lower Newton Farm, Kinnersley, Hereford in blocks of double rows of the above varieties.

Spray treatments:See Tables 1 - 3 below.

Experimental sprays started with a pre-blossom primer of 10 floz Cultar [1/5/98]. Cultar was sprayed thereafter at 7 or 14 day intervals at 5 fl oz/acre. All trees including the unsprayed controls, received routine Cultar sprays every 10 days from 20/6/98 at a rate of 5 or 7 fl oz according to variety and finishing with a half rate spray in mid August.

In effect these trees have all had the stated coverage, but because they are young and still small, only half the stated rate was actually applied to save spray wastage and reduce the cost by half. This was done by spraying with a standard Berthoud sprayer using only 6 jets [normally 12 for large trees] but calibrated to deliver 28 gpa. thus spraying twice the area.

Costings are estimated from list price of £2 / floz

Table 1] Every 7 days to June then routine Cultar

VARIETY	SPRAYS	TOTAL/ACRE	COST/ACRE
ALL	1 x 10 floz 5 X 5 floz	35 floz	£35
ASHTON BITTER	As above + routine omitting last 2 sprays	35 floz	£60
		25 floz	
ELLIS BITTER DABINETT	As above + routine omitting last 2 sprays	35 floz	£68
		33 floz	

Table 2] Every 14 days to June then routine Cultar

VARIETY	SPRAYS	TOTAL/ACRE	COST/ACRE
ALL	1 x 10 floz 2 x 5 floz	20 floz	£20
ASHTON BITTER	As above + routine omitting last 2 sprays	20 floz	£45
		25 floz	
ELLIS BITTER DABINETT	As above + routine omitting last 2 sprays	20 floz	£53
		33 floz	

Table 3] Routine sprays to all trees

VARIETY	SPRAYS	TOTAL/ACRE	COST/ACRE
ASHTON BITTER	5 X 5 floz	30 floz	£30
	2 x 2.5 floz		
ELLIS BITTER and DABINETT	1 x 5 floz	40 floz	£40
	4 x 7 floz		
	2 x 3.5 floz		

Records and samples

1] Tree girths at beginning and end of season.

2]Extension growth: total shoot growth on 2 selected branches/tree 10 trees / treatment. measured after one month [17/6/98], two months [30/7/98] and after cessation of growth.

3] Fruit set/ branch unit cross sectional area [30/7/98].

4] Fruit size/ weight [50 fruit samples][30/9/98 or Dabinett 27.10.98].

5] Juice sugar [% sucrose] and starch index at harvest.

Results of Cultar sprays on young trees

Table 4] Early extension growth [to 17/6/98][cm]

	EXTENSION GROWTH			PERCENT CONTROL	
VARIETY	CULTAR every 7 days	CULTAR every 14 days	No CULTAR control	CULTAR every 7 days	CULTAR every 14 days
ELLIS BITTER	6.6	9.5	14.9	44	64
DABINETT	2.8	2.4	10.5	27	23
MAJOR	9.5	15.1	20.1	47	75
ASHTON BITTER	7.4	7.1	18.4	40	39

Table 5] Later extension growth after start of routine sprays [to 30/7/98][cm]

VARIETY	CULTAR every 7days	CULTAR every 14 days	Late CULTAR control
ELLIS BITTER	24.6	33.1	36.4
DABINETT	14.9	13.6	32.0
MAJOR	33.2	40.3	51.5
ASHTON BITTER	10.7	16.6	35.8

Table 6] Growth increment 6 weeks from 17/6 - 30/7/98[cm]

VARIETY	CULTAR every 7 days	CULTAR every 14 days	Late CULTAR control
ELLIS BITTER	18.0	23.7	21.5
DABINETT	12.2	11.3	21.6
MAJOR	23.7	25.3	31.5
ASHTON BITTER	3.3	9.5	17.5

Table 7] Total extension growth in year 1 [mean cm]

VARIETY	CULTAR every 7 days	CULTAR every 14 days	Late CULTAR control
ELLIS BITTER	28.03	36.58	44.98
DABINETT	20.28	17.53	32.93
MAJOR	45.20	54.55	56.55
ASHTON BITTER	9.53	17.78	34.98

Table 8] Crop and fruit records [* significant effect of excess vigour on fruit set]

ELLIS BITTER [Picked 30.9.98]	Fruit set	Mean fruit weight [g]	Weight/ branch unit	% sucrose	Mean starch index
CULTAR X 7days	4.28	115.7	495	14.1	0
CULTAR X 14days	3.52	111.7	393	14.0	0.4
CONTROL	5.67	116.1	658	13.3	0

ASHTON BITTER [Picked 30.9.98]	Fruit set	Mean fruit weight [g]	Weight / branch unit	% sucrose	Mean starch index
CULTAR X 7days	7.18	78.6	564	14.4	2.8
CULTAR X 14days	8.08	69.9	565	14.6	2.4
CONTROL	4.32*	87.8	379	14.5	1.6

MAJOR [Picked 30.9.98]	Fruit set	Mean fruit weight [g]	Weight / branch unit	% sucrose	Mean starch index
CULTAR X 7days	3.35	55.8	119	14.3	3.2
CULTAR X 14days	2.16	63.2	136	14.2	3.8
CONTROL	1.77*	68.4	121	14.5	3.2

DABINETT [Picked 27.10.98]	Fruit set	Mean fruit weight [g]	Weight / branch unit	% sucrose	Mean starch index

CULTAR X 7days	4.87	88.0	429	15.0	0
CULTAR X 14days	4.78	83.5	399	15.0	0
CONTROL	2.67*	91.4	244	15.0	0

Table 9] Return bloom as fruit set/branch unit 1999

VARIETY	CULTAR every 7 days	CULTAR every 14 days	Late CULTAR control
ELLIS BITTER	2.88	*4.00	2.91
DABINETT	11.58	*12.81	17.54
ASHTON BITTER	*3.03	1.25	1.99

* Best/most annual cumulative crop over 2 years

Results and conclusion

Early flowering Ellis and Major got off to a rapid start but the 7 day program slowed shoot extension initially by more than 50%. Although the 14 day Cultar program checked both of these energetic varieties during June, it was not enough to hold Major later on. The later sprays on the control trees from July on were useful but probably to little and too late for Major.

The extra sprays at the start for the stronger varieties brought the cost up to £68/acre.

Shoot growth on Dabinett and Ashton Bitter was much less strong and later getting started, so was easily kept in check with Cultar. The 7 day program was too much for some Dabinett trees whose growth was practically nil. The 14 day program worked well for both varieties but the later routine sprays were only just adequate alone.

The early 14 day spray program cost only £20. The routine sprays brought the cost up to an additional £30/acre for the Ashton Bitter and £40 for the Dabinett.

The best shoot growth control had a significant effect on the current season's crop; the greater the growth control, the greater the number of fruit retained. This helped to bring the branches down and open up the trees, thus improving the tree shape and the chance of new laterals subsequently developing. In most cases the fruit was smaller as a result of the Cultar sprays. Some of the Dabinett trees appeared to be carrying too much crop in the year of treatment, more than twice as many as the controls in some cases. It was thought that this might adversly affect the return crop but all the Dabinett trees cropped well in the second year. The control trees were showing signs of becoming biennial. Late sprays alone made very little difference to the fruit set in the current year.

The most annual and best overall crops over the 2 years followed the 14 day Cultar program on varieties Ellis Bitter and Dabinett, and the 7 day program on Ashton Bitter. The trial was

terminated in the Major block in the second year.

Liz Copas July 1999