Focus Vineyard Workshop Bird management, Measuring damage, Falcons for Grapes

Summary:

Ecological management:
Managing birds involves knowing why they are there, when they are there, and how to make them move.
Blackbirds and thrushes are residential and may even have chosen a vineyard because they need fruit in autumn to prepare for winter. Numbers can be reduced earlier in the season, before the juvenile birds swell the population. 60% of juveniles do not survive winter but in autumn numbers are plentiful.

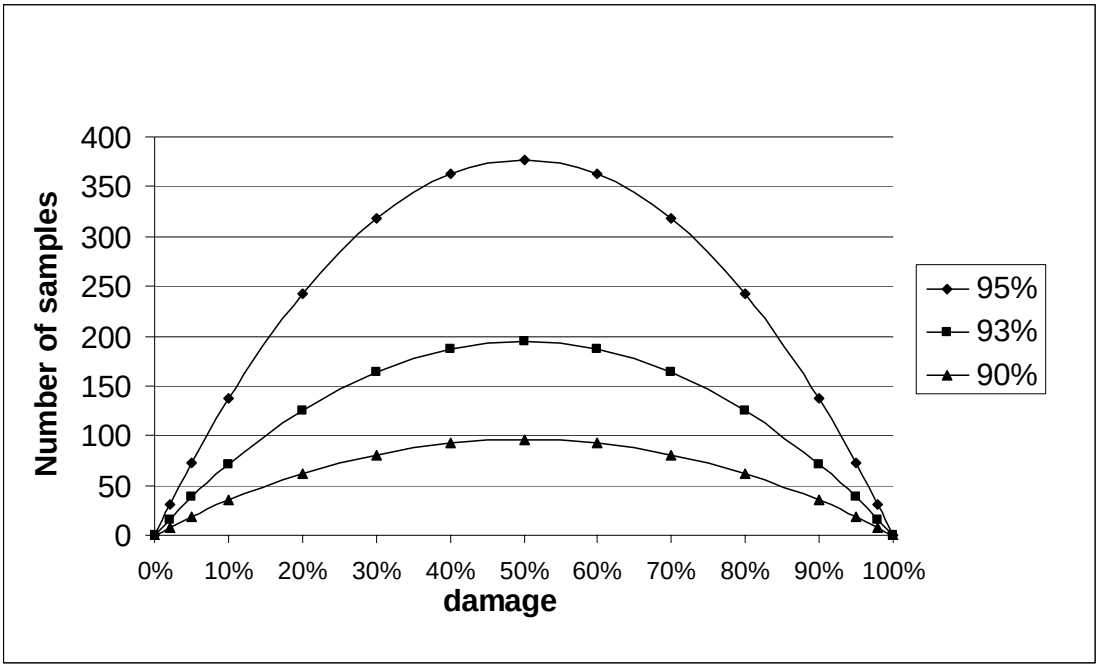
Starlings may be nesting in trees near your vineyard. These may be moved on at a time they are sensitive to danger – i.e. at nesting time. Don't wait for grape ripening time when numbers are large due to juveniles that feed on fruit because it is easy 'prey'.

Silvereyes (waxeyes) may be attracted to grapes for the juice – ideas on how to dissuade them are scarce. Alternative feeding is a subject of research at present.

Budget and economic assessment of damage:
From the workshops it is clear that detailed or indeed any knowledge of the vineyard budget for bird management is rare. Whether the money is wisely spent is complete unknown. Any change in management will not be able to be evaluated economically unless the level of damage sustained can be compared. Aside complications such as differences in seasonal weather, differences in crop load or changes in environment, there is still a need to accurately measure grape damage. This method was developed in conjunction with the Falcons for Grapes project, where accurate knowledge of actual grape damage is needed to evaluate the economic value of the project to the industry.

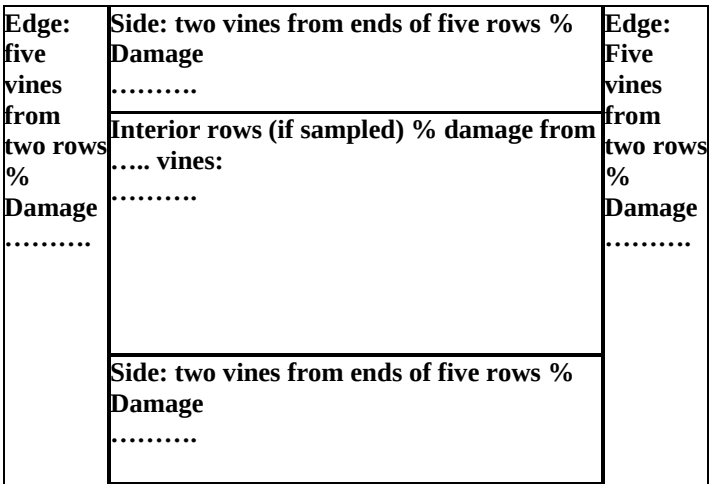
Measurement of damage:
There are 4 components to the measuring procedure:
1. How many samples are needed?
2. How are they selected?
3. How are the damaged bunches assessed?
4. How is the percentage damage calculated?

How many samples?
Refer to the diagram below. 95% confidence interval means a 2.5% margin of error and is an acceptable level of accuracy. If damage is 7% or lower then 100 samples are sufficient. If damage is higher than 7% then there is a trade-off between sample number and accuracy. For example if damage is 15% then the choice is to take more samples and maintain the 2.5% margin of error, or to stick with 100 samples and accept a 3.5% (93% confidence interval) margin of error.



How do I select clusters?

See the diagram below. Vineyards generally sustain more bird damage at edges than in the interior (unless starlings are the culprits). In order to calculate a more accurate overall damage level the edges are surveyed separately from the interior, the survey is 'stratified' into 5 areas. 20 samples are taken from each.



To avoid individual bias, a systematic sampling method uses a Latin square design to help select bunches. This means that clusters from different parts of the canopy are equally selected. The Latin square appears here:

A	**B**	**C**	**D**	**E**	**B**	**A**	**E**	**C**	**D**
C	**D**	**A**	**E**	**B**	**D**	**E**	**B**	**A**	**C**

A simple device such as a metre rule and some bale twine can ensure the selection is accurate. Here is a photograph of the device used in Marlborough in 2006:

In Marlborough grape clusters were spread over about 150cm canopy depth, in Hawkes Bay most clusters were within a 50cm depth of spread. The knotted twine is to help with vertical selection. If vertical selection is not a problem then there is no need to use the twine.
When the cluster is selected then damage is assessed on BOTH SIDES of the cluster. The photographs below show that damage can be very different on each side.

How do I assess damage?
The amount of damage is entered on a datasheet. The datasheet appears below and can be printed and copied for use.

Visual assessment without removing clusters is necessary, but obviously subject to individual skill. To correct for under- or over-estimation of damage, and to be sure that the final figure is accurate, every 10th bunch is taken for examination later.

How do I calculate the damage?
Enter the figures in the damage assessment excel sheet. A final figure will be calculated when all the data needed are entered. The live excel sheets can be obtained by emailing saxtonv@lincoln.ac.nz when they will be sent back to you by email.

How do I correct for the visual assessment?
Enter the estimated damage from the bunches taken home on the excel calibration sheet. Then for each bunch count the
Empty brushes (for berries removed)
Good berries as you remove them
Damaged berries left on the cluster

The spreadsheet will calculate the total number of berries and the actual damage sustained by that cluster. With data from 20-30 clusters an overall correction factor can be confidently calculated (10 is a bit too few) by the spreadsheet. This final factor should be entered into the damage calculation sheet so that the final damage figure can be corrected.

What about edge versus interior damage?
The spreadsheet will also 'weight' the damage figures according to the size of the block. The interior damage figure should drive the final figure more than the edge values. This is important because it is tempting to assess damage by looking at areas near the edge of the vineyard, and not in the interior.

Get your excel spreadsheets from
saxtonv@lincoln.ac.nz

For information about Falcons for Grapes visit the website:

www.falconsforgrapes.org

This sheet (double sided) can be reproduced for use in the vineyard
Method protocol

1. Obtain a metre rule and coloured string. Mark off from 10cm at 20cm intervals (5 marks) as A, B, C, D and E. Loop the string over the rule and knot. Make further knots at 10 cm down the string. This is the sampling apparatus.

2. Obtain 5 polythene plastic bags for each vineyard block to be sampled, and a waterproof marker pen.

3. Take copies of the sampling datasheet, one for each block to be sampled. On the back of this sheet copy a Latin square of numbers for selecting bunches.

4. This is the Latin square for the rule:

A	B	C	D	E
B	D	A	E	C
D	E	B	C	A
E	C	D	A	B
C	A	E	B	D
E	D	C	B	A
C	E	A	D	B
A	C	B	E	D
B	A	D	C	E
D	B	E	A	C

And for the string:

1	2	3	4	5
2	4	1	5	3
4	5	2	3	1
5	3	4	1	2
3	1	5	2	4
5	4	3	2	1
3	5	1	4	2
1	3	2	5	4
2	1	4	3	5
4	2	1	5	3

Grape damage assessment sheet Vineyard

Block Total vines # rows

Date Name of assessor Cultivar

Edge values (% damage assessed visually)

Row	Vine 1	2	3	4	5	6	7	8	9	10	total
1											
2											

Total /20 =

Row	Vine 1	2	3	4	5	6	7	8	9	10	
1											
2											

Total /20 =

End values

Row#	vine 1	vine 2
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Total /20=

Row#	vine 1	vine 2
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Total /20=

Interior values

Row	Vine 1	2	3	4	5	6	7	8	9	10

Total /20 =