Infestation by CBB (%)

Date **Farm :**
Lot # **Evaluator:**

Tree #	# Green Berries	# Berries Infested	*B. bassiana*
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
Total			

% infestation = $\frac{\text{Berries Infested x 100}}{\text{Green Berries}} =$

Second step - carefully cut open top of cherries

% Positions of CBB = **Live AB =** **Dead AB =**
CD = **Absent =**

Observations:

Training on Integrated Pest Management of Coffee Berry Borer in Hawaii

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Monitoring the CBB and Decision Making for Controls

1- Select the coffee lot.
2- Draw a map of the coffee lot.
3- Select a corner of the coffee lot and start the sampling in a tree.
4- Select a coffee branch in the middle of the tree.
5- Count the number of green berries (berries more than 90 days old).
6- Count the number of green berries infested by CBB.
7- Record the information on the format for this coffee tree such as tree # 1.
8- Collect about 3 green berries infested by CBB (for evaluation of CBB positions such as AB or CD).
9- Then move for the next tree. (move in zig –zag about 15 to 20 yards and select tree # 2).
10- Again following the steps 4 to 8 in the tree #2.
11- Then move for the next tree (tree # 3).
12- Repeat those steps until complete for 30 coffee trees.

Now take the information collected and make calculations to obtain the percentage of infestation by CBB. **% infestation = Total green berries infested / Total green berries x 100**

Example: In the 30 coffee trees sampled we have the following information:
Total green berries = 1500
Total green berries infested by CBB = 40
% infestation = 40 ÷ 1500 x 100 = 2.66%

Positions of the CBB in the berries

After 100 green berries infested by CBB have been collected, each single berry has to be cut in order to determine its position (AB or CD).

Remember in AB position the CBB is entering or boring the fruit but the endosperm (coffee seed) has not been affected by the CBB. So you can see the back part of the CBB body entering to the fruit. In this position the CBB is highly vulnerable to be killed by natural enemies, weather, or by application of the bio-insecticides like *Beauveria bassiana* or by chemical insecticides.

On the other hand, in CD position, the CBB is completely safe. The endosperm (coffee seed) has been damaged by the female and by its progeny (larvae). Neither *B. bassiana* nor chemical insecticides can control the CBB in this position. CBB in position CD (inside the endosperm or coffee seed) may only be controlled by manual recollection of the berries (when the berries become ripe) or by parasitoids like *Prorops nasuta* or *Cephalonomia stephanoderis*. However, they are not available for farmers at this time.

Interpretation of the results:
It depends of the coffee lot conditions and the season of the year. A high percentage of CBB (living) in AB, means they are vulnerable and may be controlled by applications of the *B. bassiana*.