

**Comparison of responses between 2011 and 2012 CBB surveys**  
**‘How are we doing in the war with CBB’**  
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Survey period began mid-September 2012, reported December 1, 2012. Comments to: hcbitt@hawaii.edu

**Summary.**

The Marketable Green Bean Recovery Ratio (MGBRR) for the 2011 crop as stated by farmers in Question 9 (Q9) of the 2012 survey was 6.3, equal to 20% loss of green bean. Cherry buyers who sampled for CCB damage estimated 22% both for cherry loss (Q10) and green bean loss (MGBRR = 6.3 (Q63)).

Fifty percent of farmers in 2012 felt CBB was decreasing on their farms; in 2011 only 13% thought it was decreasing.

**Sanitation.**

The slogan “Contain and Kill” means managing all coffee cherry on your farm beginning with the harvest so that all CBB—adults, larvae, and eggs—in the cherries can be destroyed.

Growers reported increasing success in using sanitation while harvesting. In 2012, 86% farmers said their pickers make an effort not to drop cherries during harvest; versus 62% in 2011. In 2012, 54% said pickers made some effort to pick up dropped cherries; versus 37% in 2011. Slightly more farmers in 2012 (63 % vs. 51% previously) took everything picked to the wet mill. Farmers (48%) report using closeable containers that prevent CBB escape during transport to the wet mill. However there is little change in the percent who pulp everything harvested and who pulp floater cherries. CTAHR recommends pulping everything including floater cherry because there can still be 1 good bean in floater cherry. Virtually no one reported screening the wet mill to prevent CBB escape once the cherry is delivered and during pulping. 8% reported screening the fermentation tank, even applying a sticky substance to the screens. In 2012, 68% of farmers treat mill waste to kill CBB, but 18% return it to the orchard presumably untreated, and 14% take it to the dump. Last year 60% treated mill waste, 32% simply returned it to the orchard, 8% took it to the dump. There has been no increase in the number of screened drying decks, although CBB do escape from drying parchment. However, 60% reported attempting to kill CBB around the wet mill, mostly by trapping, while only 36% reported doing so in 2011. After harvest in 2011, 60% of farmers attempted to remove (strip and destroy) all coffee from their trees, while 2012 84% pledge to do so after this harvest.

Reports at the 2012 International Conference on Coffee Science stated that the greatest predictor of future CBB damage on a farm is the number of infested cherries per tree after harvest. CBB infestation on farms or in feral coffee has little effect on farms greater than ¼ mile away.

**Trapping.**

In 2012, trap use increased to 76% of farms, compared to 53% in 2011. 25% of farms use 20 traps per acre; in 2011 23% used 12 traps per acre. Most farms say they trap year round, though March and April have the highest captures. Traps made from milk cartons with “flaps” for the CBB to hit and fall into the kill solution are the most popular trap. Trapping is becoming more popular, and we need to determine if there is any control benefit in the orchard.

**Spraying the fungus *Beauveria bassiana*.**

80% of farmers spray the fungus in 2012, which is similar to 2011. While 10% spray year round, the majority begin in Feb to April. In 2012, 39% of farmers spray every 4 wk, 29% every 6 wk. In 2011, 27% sprayed every 6 wk followed by 20% at 4 wk. In 2012, 38% of farmers spray less than 16 oz of *Beauveria* per acre, but *Beauveria* applications per acre per year are increasing due to more frequent spraying. Virtually all sprays contain a silicone surfactant. A typical spray solution is 0.3% surfactant, 4 oz in 24 gallon spray solution. Rate averages 32 to 40 gal/acre. Twice monthly sprays of kaolin clay (Surround) by E. Burbano Greco and Steiman in Kona were found to be effective as a CBB deterrent, damaged cherries decreased, yield increased. Second year results are pending.

**Are farmers leaving coffee due to CBB?**

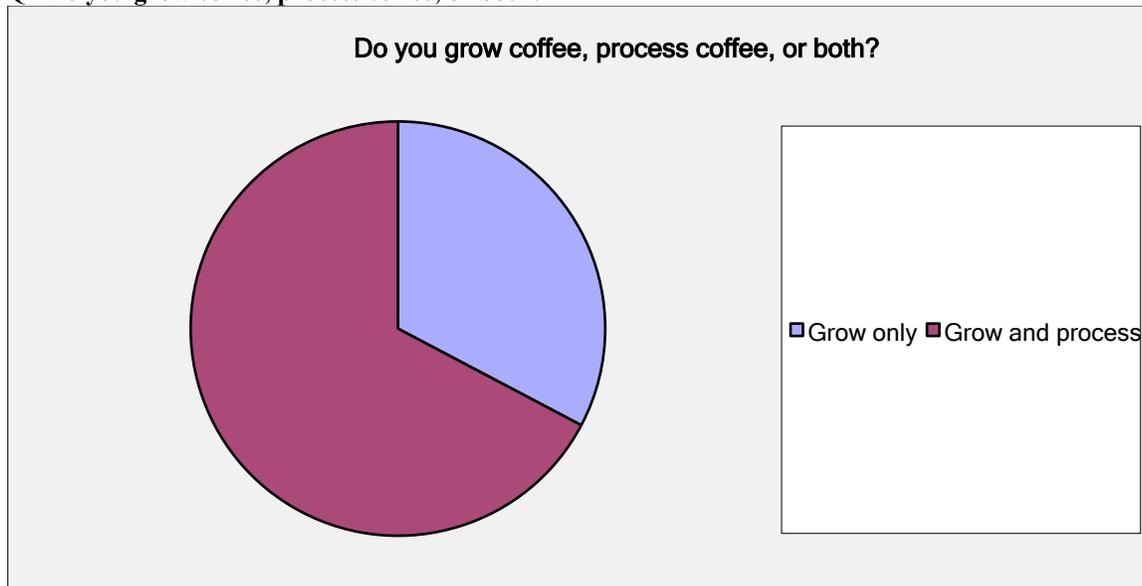
58% of farmers reported that no one was quitting coffee, 19% knew of five, 10% knew of 10 quitting. 50% of farms now border areas with feral or abandoned coffee.

**Where do you get CBB information?**

Important sources of information on CBB control are: other farmers (84%), the farmer’s coffee organization website (68%), CTAHR workshops (66%), CTAHR website (63%) see ALERTS at [www.ctahr.hawaii.edu](http://www.ctahr.hawaii.edu), and my coffee organization workshops (60%). Compared to 2011, CTAHR sourced information is increasing in importance.

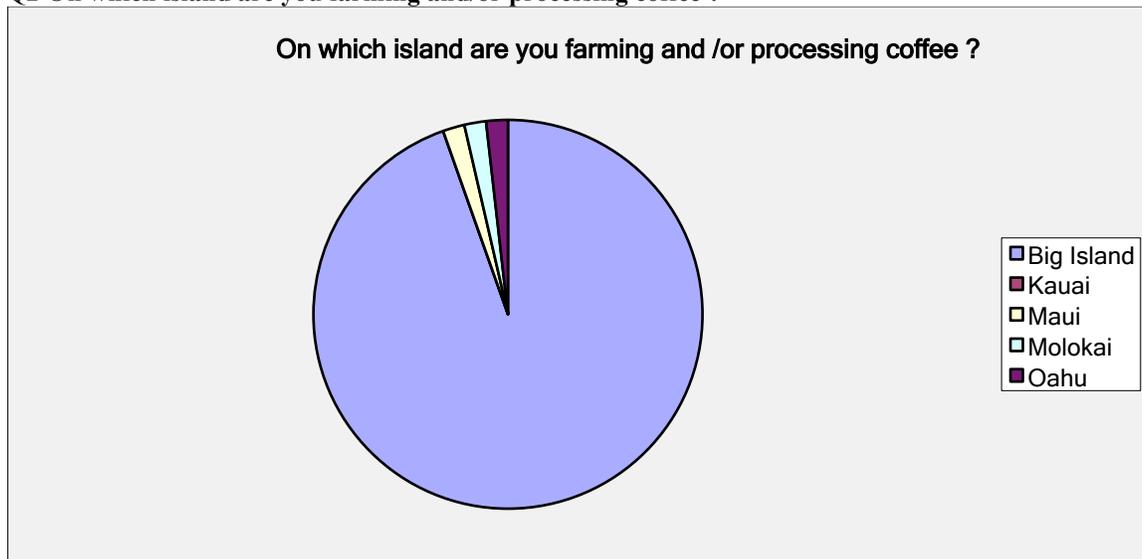
Questions and responses, followed by Bittenbender's comments.

**Q1 Do you grow coffee, process coffee, or both?**



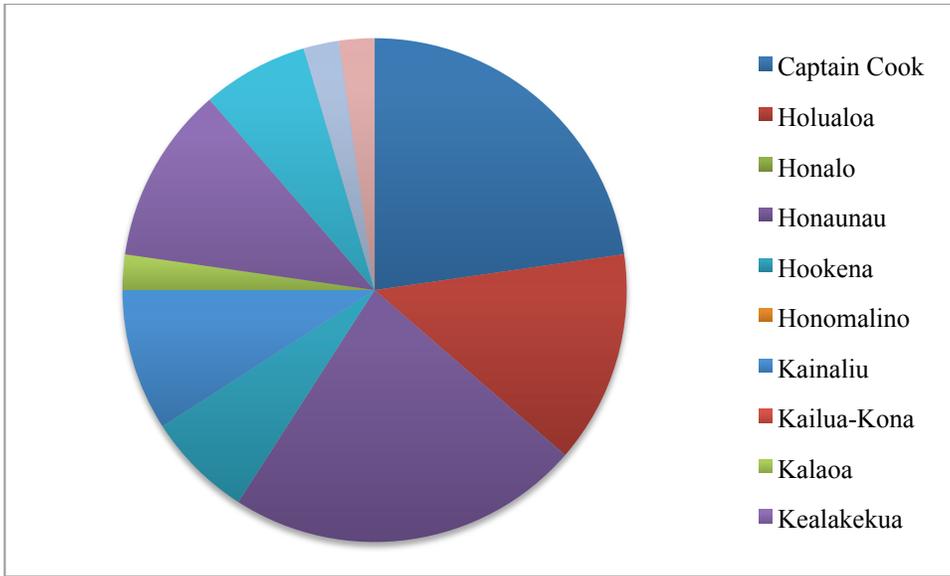
In 2012, 18 only farmed coffee and 37 farmer/processors responded. In 2011, 49 only farmed coffee and 77 coffee farmer/processors responded.

**Q2 On which island are you farming and/or processing coffee ?**



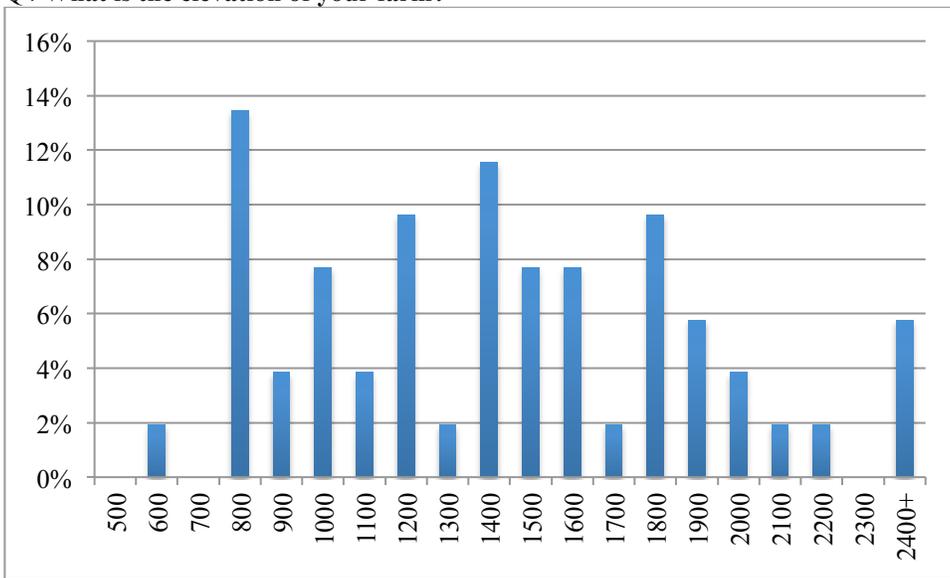
In 2012, 94% of respondents were in Kona, in 2011 97% were in Kona.

**Q3 If you are growing coffee in Kona, please select the name of the area from the drop down menu below that is closest to your farm.**



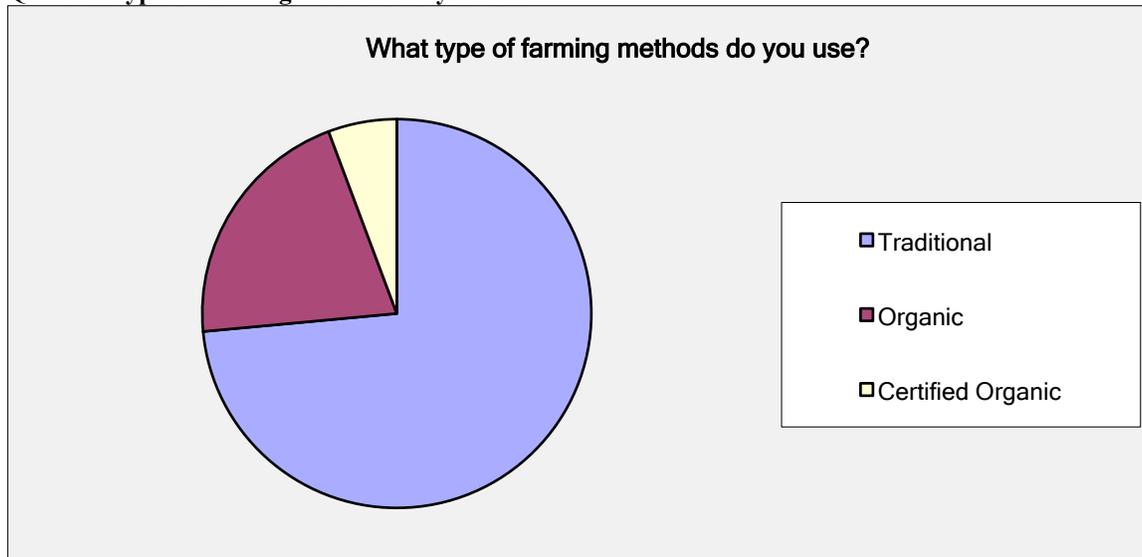
In 2012, 22% of respondents were in Capt Cook and Honaunau, followed by Holualoa at 14%. In 2011, 30% of respondents were from Capt. Cook, 21% Holuloa, and 17% Honaunau.

**Q4 What is the elevation of your farm?**



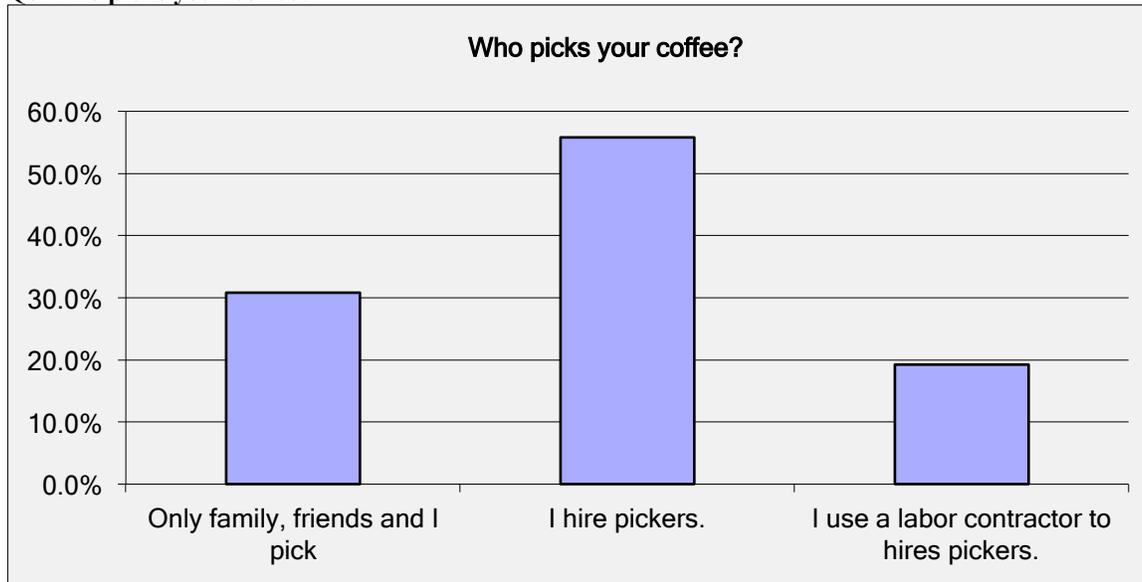
In 2012, 13% respondents were at 800 ft elevation, 11% at 1400 ft, nearly 10 % at 1200 and 1800 ft, and 6% at 2400 ft or higher. In 2011, 18% of respondents in Kona were at 1400 to 1600 ft elevation, 16% at 800 to 1000 ft, and 4% above 2200 ft.

**Q5 What type of farming methods do you use?**



72% of respondents were farming with traditional methods; in 2011 there were 70%,

**Q6 Who picks your coffee?**



In 2012, 30% of farmers did not hire pickers; in 2011 34% did not hire.

**Q7 How big is your coffee farm?**

In 2012, average farm size reported was as 12 acres or 5,400 trees, in 2011 reported farm size averaged 6 acres or 3,000 trees. Several large farms responded raising the average farm size.

**Q8 Did you have CBB on your farm in the 2011-12 season?**

78% of farms reported having CBB in the 2011 season. In 2010 56% farmers had CBB.

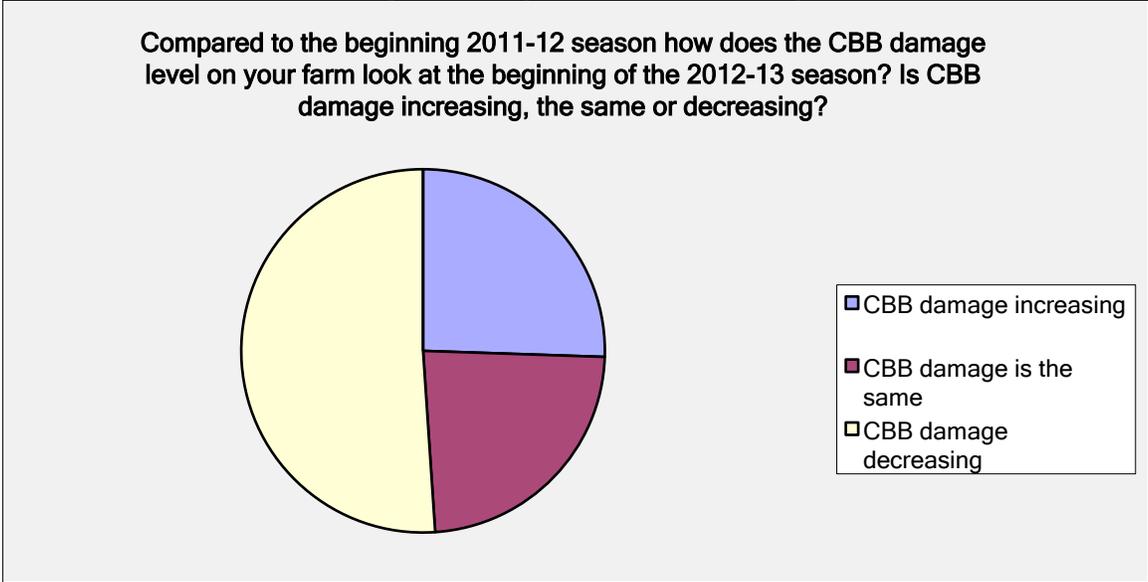
**Q9 What was the 2011-12 season's marketable green bean recovery ratio (MGBRR); this is calculated as cherry weight divided by marketable green bean weight ?weight?**

Average MGBRR reported for 2011 by 28 farmers was 6.3 or 20% green bean loss. The highest was 8.9 or 42% green bean loss. 14 farmers said they didn't know. The average MGBRR reported in the 2010 crop was 5.7 or 13% green bean loss, but this number is questionable as it was similar to before CBB arrived.

**Q10 If you sell only cherry but your buyer samples your cherry and tells you the percent CBB damage please list all the damage percents given to you for the 2011-2012 season.**

Farmers who sell cherry say their buyer found on average 22% cherry loss; versus 15% in 2010.

**Q11 Compared to the beginning 2011-12 season how does the CBB damage level on your farm look at the beginning of the 2012-13 season? Is CBB damage increasing, the same or decreasing?**



51% of farmers felt their CBB damage in 2012 season was decreasing; this is an improvement over 2011 when only 13% felt CBB was decreasing.

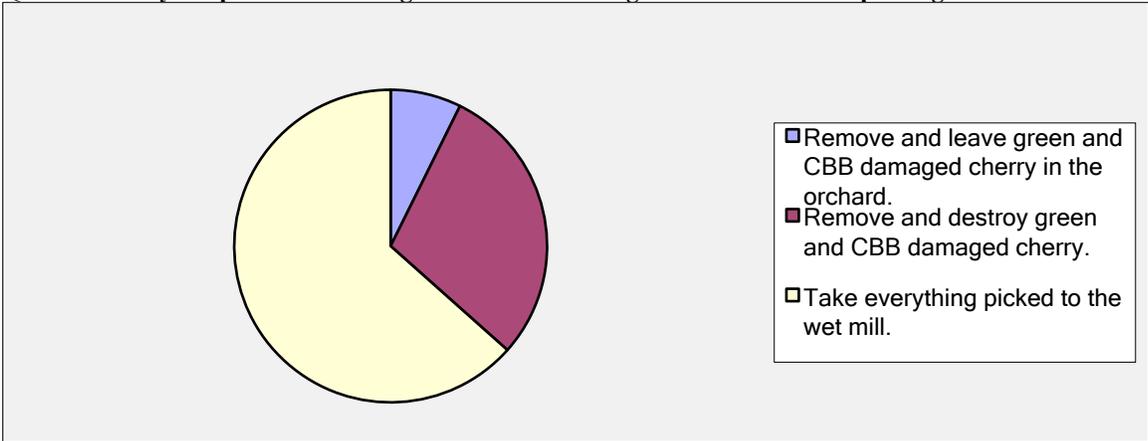
**Q12 Do your pickers make an effort not to drop cherries on the ground when picking?**

In 2012 86% of farmers said their pickers made an effort not to drop cherries during harvest; versus 62%, in 2011 year.

**Q13 Do your pickers make an effort to pick up dropped cherries?**

In 2012, 54% said pickers make some effort to pick up dropped cherries; versus 37% in 2011.

**Q14 What do your pickers do with green or CBB damaged cherries in their picking baskets?**

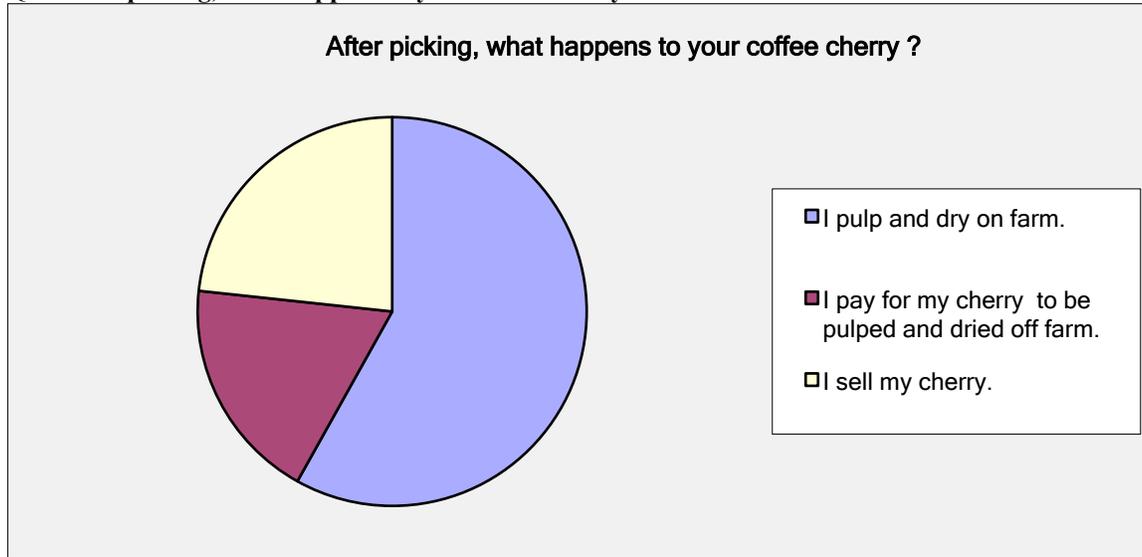


In 2012 63% of farmers said everything in pickers' baskets goes to a wet mill. Only 7% said pickers leave infested and green cherry in the orchard. In 2011 51% took everything to the wet mill.

**Q15 Do you dump the picking baskets into bags or containers that prevent CBB escaping before reaching the wet mill?**

In 2012 48% of farmers used closed (CBB proof) containers to hold and to transport cherry to wet mill.

**Q16 After picking, what happens to your coffee cherry ?**



In 2012, 23% of farmers said they sold their cherry, 58% of farmers pulped and dried on farm.

**Q17 When you pulp, what happens to the floater cherries?**

In 2012 42% of farmers pulped everything and 58% discard cherry floaters; versus 39% pulped everything and 60% discarded floating cherries in 2011. CTAHR recommends pulping everything, even floaters, as one bean may be undamaged, we need to increase our message to pulp floaters.

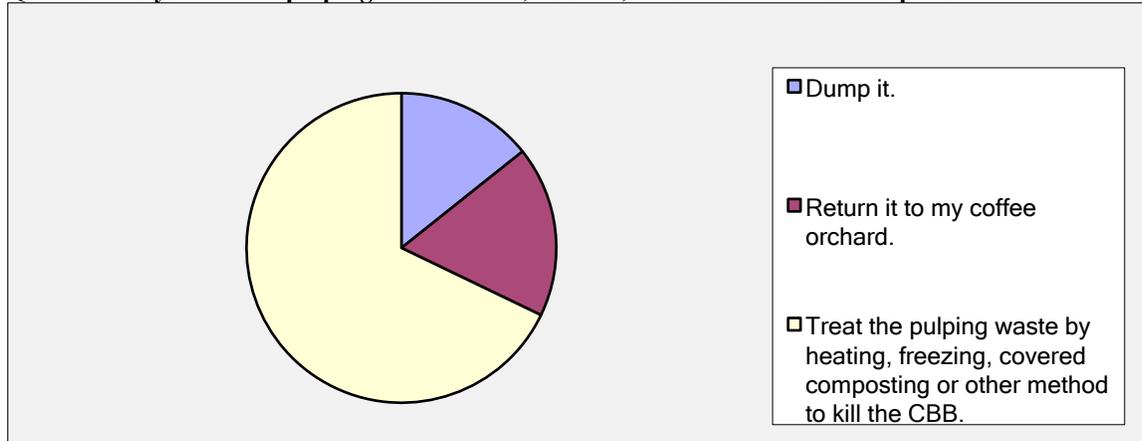
**Q18 After pulping do you process all parchment coffee or do you discard floating parchment coffee without processing?**

In 2012 81% discarded floating parchment coffee, versus 79% in 2011. No change but an opportunity to completely destroy CBB-infested parchment.

**Q19 Are the pulping and fermentation areas at the wet mill completely screened in to prevent escape of CBB?**

In 2012 no farmers screened in the wet mill, 8% screened the fermentation tank.

**Q20 How do you handle pulping waste - skins, floaters, discarded cherries and parchment?**



In 2012, 68% of farmers treated mill waste to kill CBB, but 18% returned it to the orchard presumably untreated, and 14% took it to the dump. Last year 60% treated mill waste, 32% simply returned it to the orchard, 8% took it to dump. There is less CBB-infested waste being returned to the orchard but this needs to be reduced to 0% untreated mill waste and water returning to coffee orchards. Taking mill waste to the dump should be discouraged unless mill waste is treated at the dump, due to the risk for reinfestation of farms or feral coffee.

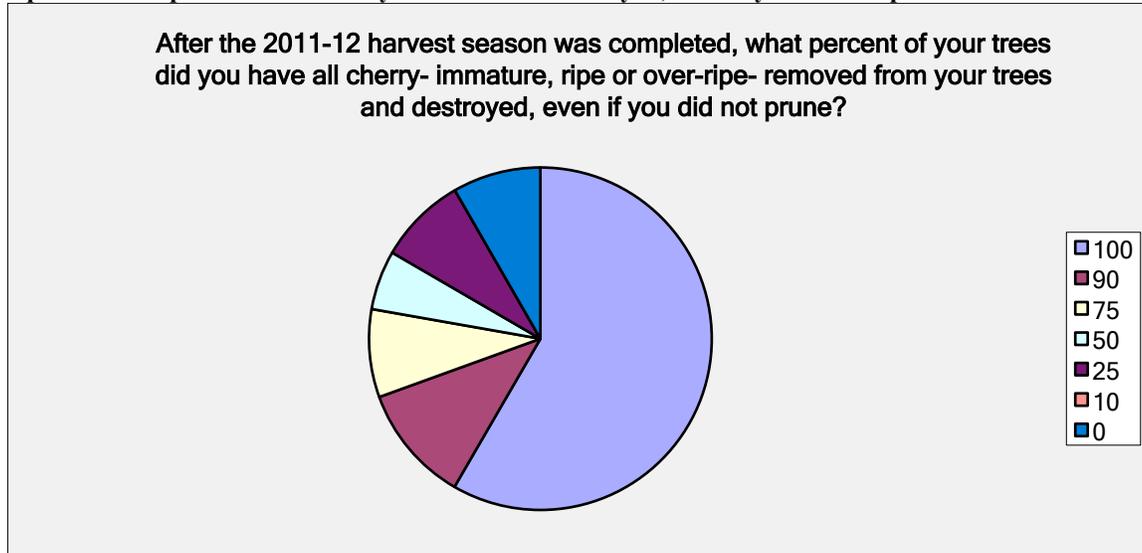
**Q21 Is your drying area screened to prevent CBB escape?**

Only 14% of farmers screen the drying area to contain CBB same as in 2011. We need to encourage more screening. One grower reported placing a black tarp over his parchment coffee for 1 hr daily to kill CBB.

**Q22 Do you attempt to contain and kill the CBB in the wet mill and drying areas, how are the CBB killed?**

In 2012, 60% of farmers attempt to contain and kill CBB in the mill area. The most common method to contain and kill is a CBB trap (35%) followed by sticky traps 22% and 18% spray *Beauveria*. One farmer each tried sticky screens, steam, electric bug zapper, black tarp covering the parchment coffee for 1 hr /day, and treating ferment waste and water. This is an improvement over 2011 when only 36% reported trying contain and kill in the mill areas.

**Q23 After the 2011-12 harvest season was completed, what percent of your trees did you have all cherry- immature, ripe or over-ripe- removed from your trees and destroyed, even if you did not prune?**



At the end of the 2011-12 season 60% of farmers stripped all remaining cherry on 100% of their trees, 80% said 75 % of their trees were striped only 8 % did nothing. When asked their intentions in the 2011 survey 80% indicated that they would strip all trees at the end of the 2011-12 season. This is great improvement! At the end of the 2010-11 season, only 37% said they stripped their trees.

**Q24 After the 2012-13 harvest season will you have all cherry- immature, ripe or over-ripe- removed from all trees and destroyed, even if you don't prune.**

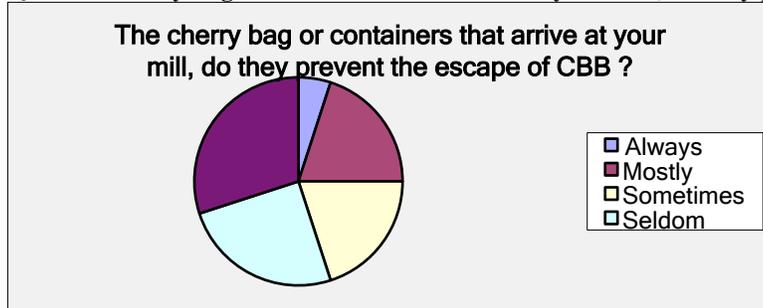
In 2012 84% percent of farmers said they will strip and destroy all cherry after the 2012 harvest; this is up from 60% in 2011! We must encourage them to strive for 100% of coffee trees stripped of all cherry at end of each harvest season. Studies in Costa Rica and El Salvador reported at the ASIC 2012 conference found that breaking the life cycle of the CBB by removing all cherry from all trees after harvest and before pruning and destroying those cherries is the most important cultural practice a farmer can do to prevent infestation on the next crop.

**Q 25 What is your most effective sanitation tactic for your farm?**

Similar to the 2011 survey, farmers felt the sanitation tactics in order of effectiveness were stripping trees at the end of the harvest season, treating all mill waste to kill CBB, pulp all cherry picked, and contain and kill CBB in the mill area. Not dropping cherries while harvesting and picking up dropped cherry were somewhat effective.

**Questions for wet millers.**

**Q26 The cherry bag or containers that arrive at your mill, do they prevent the escape of CBB ?**



In 2012 25% of wet millers mostly received cherry bags sealed to prevent CBB escape, 55% don't.

**Q27 When you pulp, what happens to the floater cherries?**

In 2012, 55% of wet millers pulped all cherry received, this needs to be increased to 100% of floating cherry is pulped. This will save undamaged green bean. We need data to back up the assertion that floating cherry contains undamaged green bean.

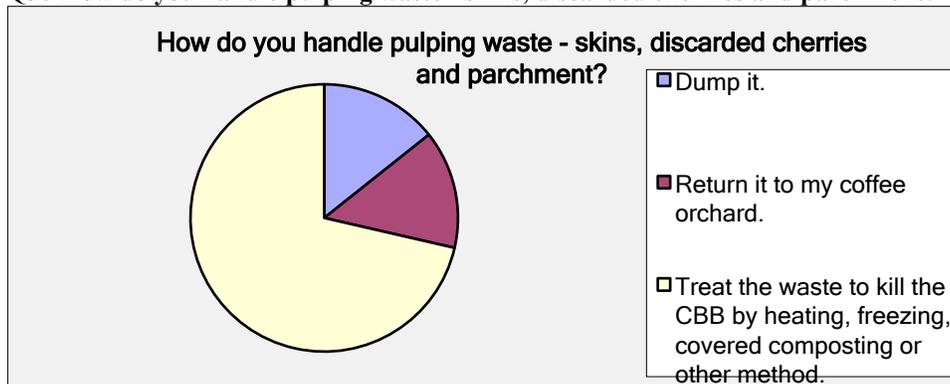
**Q28 After pulping do you process all parchment coffee or do you discard floating parchment coffee without processing?**

In 2012 86% of wet millers discard floating parchment; the remaining processed all parchment coffee.

**Q29 Are the pulping and fermentation areas at the wet mill completely screened in to prevent escape of CBB?**

In 2012 only 5% of wet mills were screened to prevent CBB escape, we need to screen wet mill areas to contain CBB, from where they are most likely to escape.

**Q30 How do you handle pulping waste - skins, discarded cherries and parchment?**

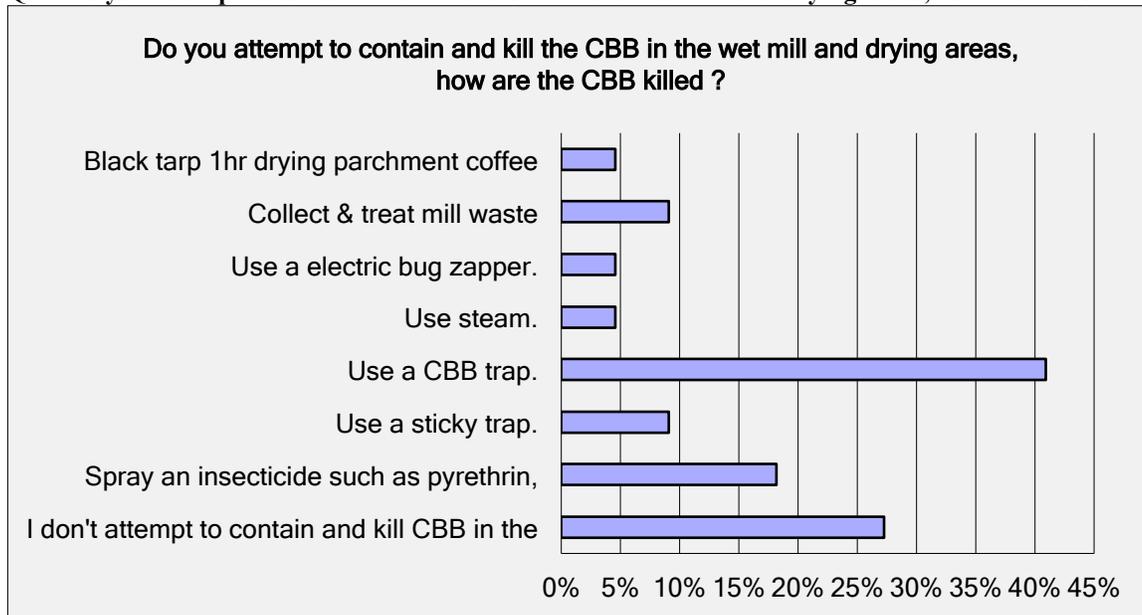


In 2012, 71% of wet mills treated waste to kill CBB, but 28% either dumped or returned it to their coffee orchard. All wet mill waste should be treated to kill CBB. Mill waste containers should be sealed to prevent CBB escape when transported to the dump. It is preferable to treat mill waste to kill CBB before it leaves the mill.

**Q31 Is your drying area screened to prevent CBB escape?**

In 2012, only 15% of wet millers screened their drying area. This needs to be increased to contain and kill CBB emerging from drying parchment.

**Q32 Do you attempt to contain and kill the CBB in the wet mill and drying areas, how are the CBB killed ?**



In 2012, 27% of wet millers did not attempt to contain and kill in mill area. 41% used a CBB trap in mill area, followed by 18% who used an insecticide. All mills need to use some method to contain and kill CBB.

**Q62 How will you measure CBB damage on cherry you purchase in 2012-13 season?**

Most wet millers appear to use % damaged cherry (CBB hole) calculated by count or weight of damaged cherry. This can over estimate damage, if both seeds are not damaged.

**Q63 Last season (2011-12) for the cherry I purchased I estimate the marketable green bean recovery ratio (cherry weight divided by marketable green bean weight was ...**

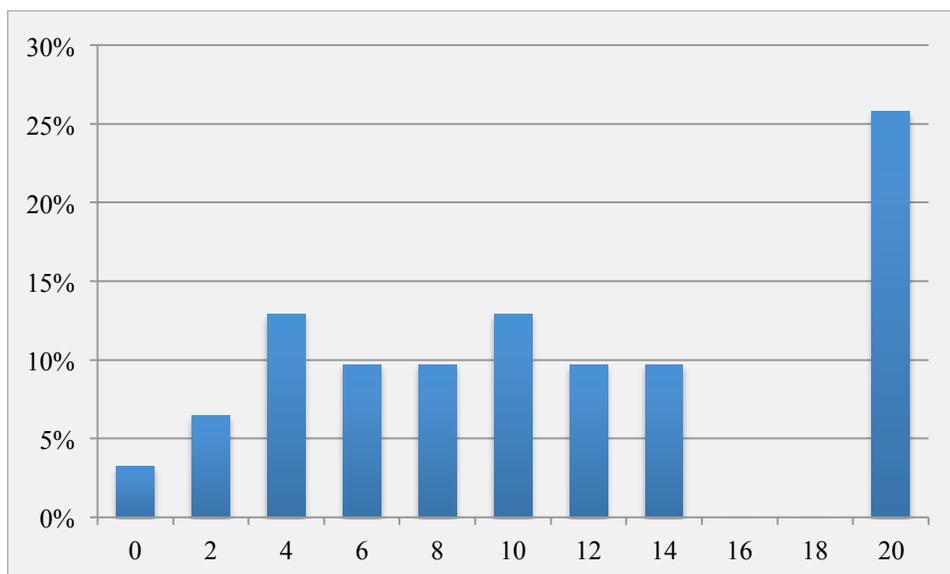
8 cherry buyers report the average MGBRR in their 2011-12 season purchases to be 6.4 or about 22% green bean loss.

**Use of CBB Traps by Farmers**

**Q33 Will you use traps baited with methanol and ethanol to catch CBB this 2012-13 season?**

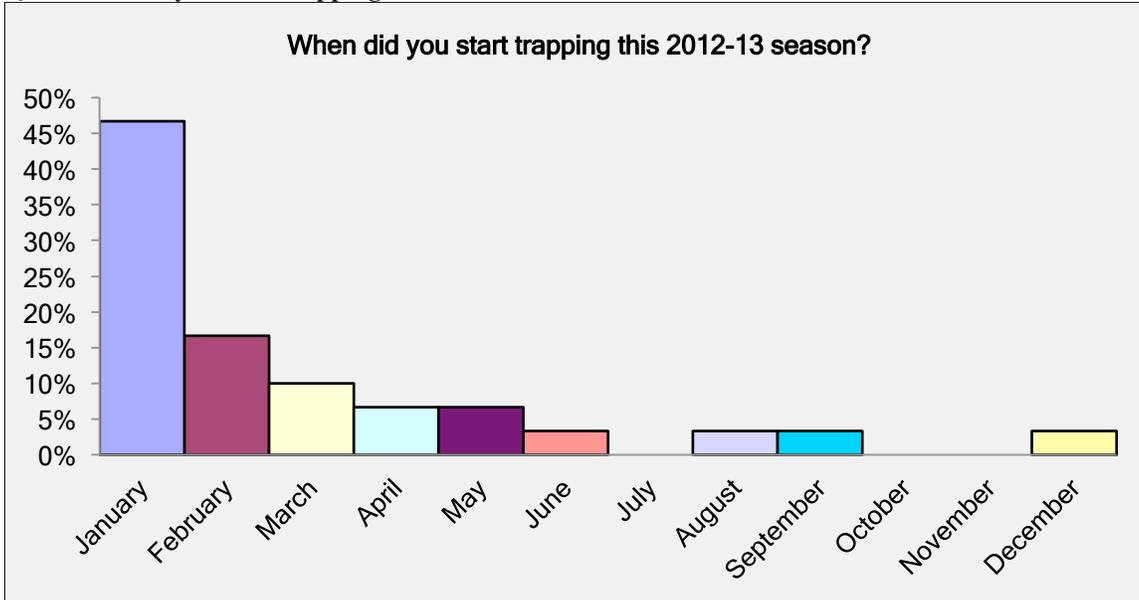
In 2012 trap use increased to 76% of farms, compared to 53% in 2011.

**Q34 How many traps per acre will you use in the 2012-13 season?**



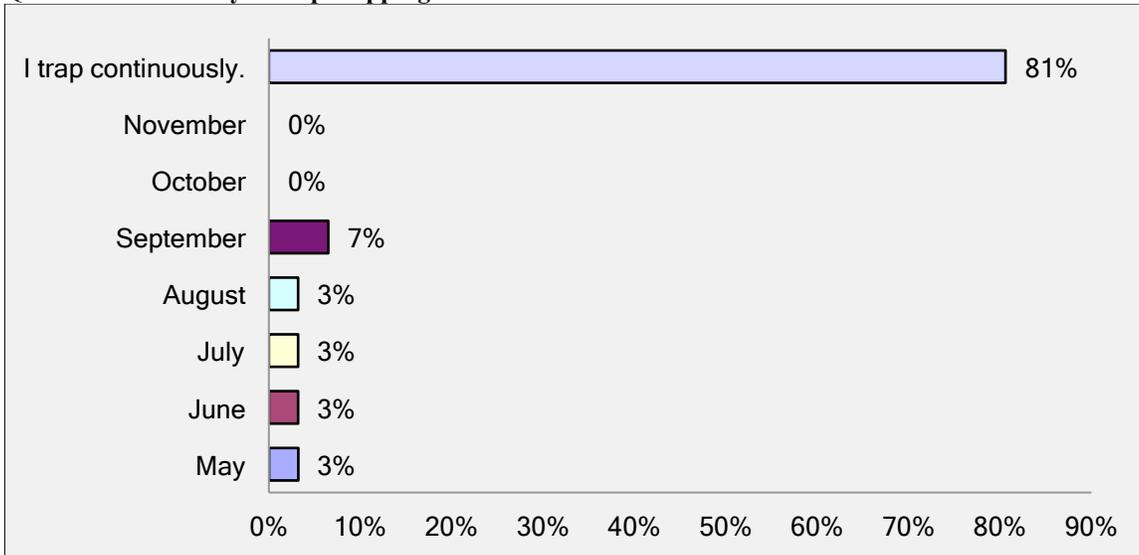
In 2012, 25% of farmers who trap said they use 20 traps per acre compared to 23% who used 12 traps /acre in 2011. There has been a tremendous increase in trap usage. Trapping is becoming more popular, we need to determine if there as control benefit in the orchard and wet mill.

**Q35 When did you start trapping this 2012-13 season?**



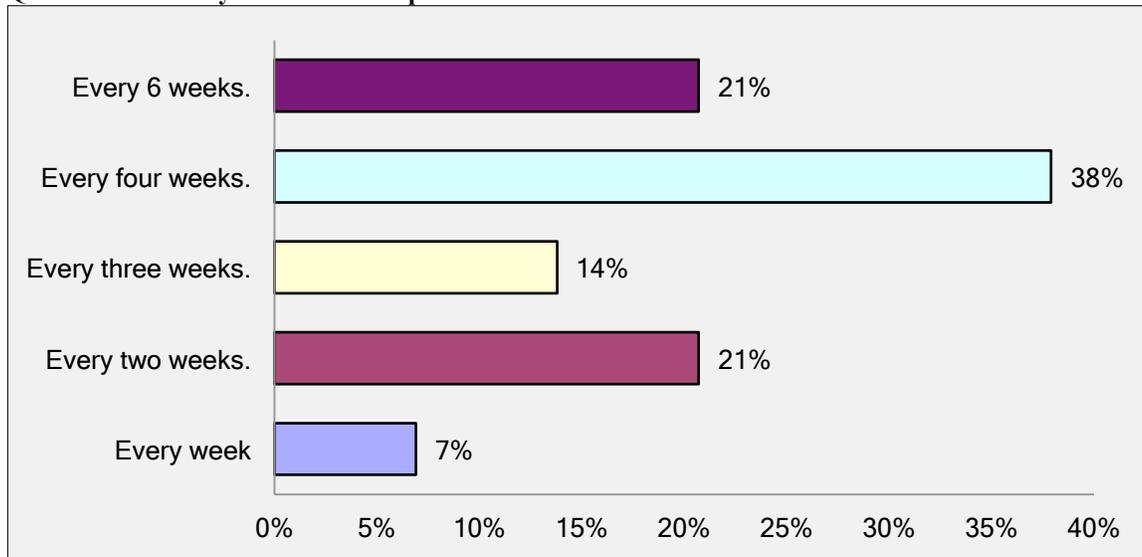
In 2012, 47% of farmers began trapping in January for the 2012 season, 74% by March. In 2011, only 9% started trapping in January, and 20 % started in June. Farmers are trapping earlier and with more traps per acre.

**Q36 When did/ will you stop trapping in the 2012-13 season?**



In 2012 81% of farmers will trap continuously.

**Q37 How often do you clean the traps?**

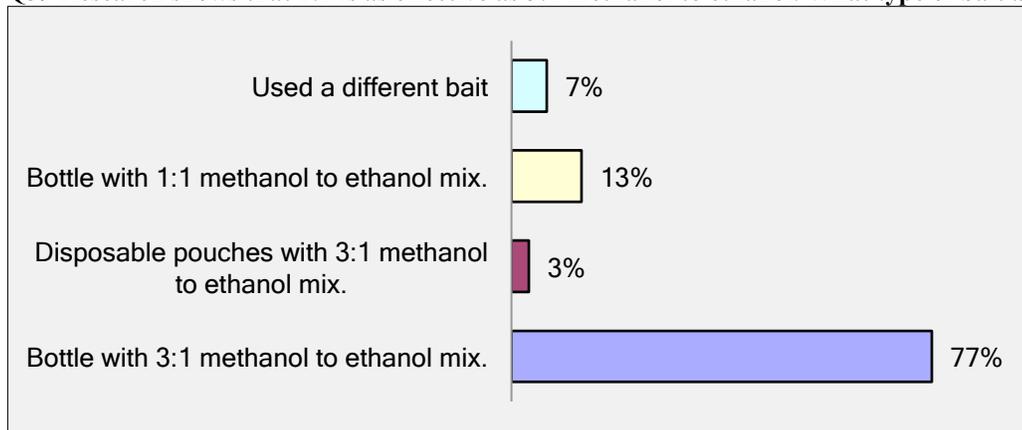


In 2012 38% of farmers clean traps once a month, compared to 2011 when farmers cleaned traps less frequently.

**Q38 How do you kill the CBB in the collection cup?**

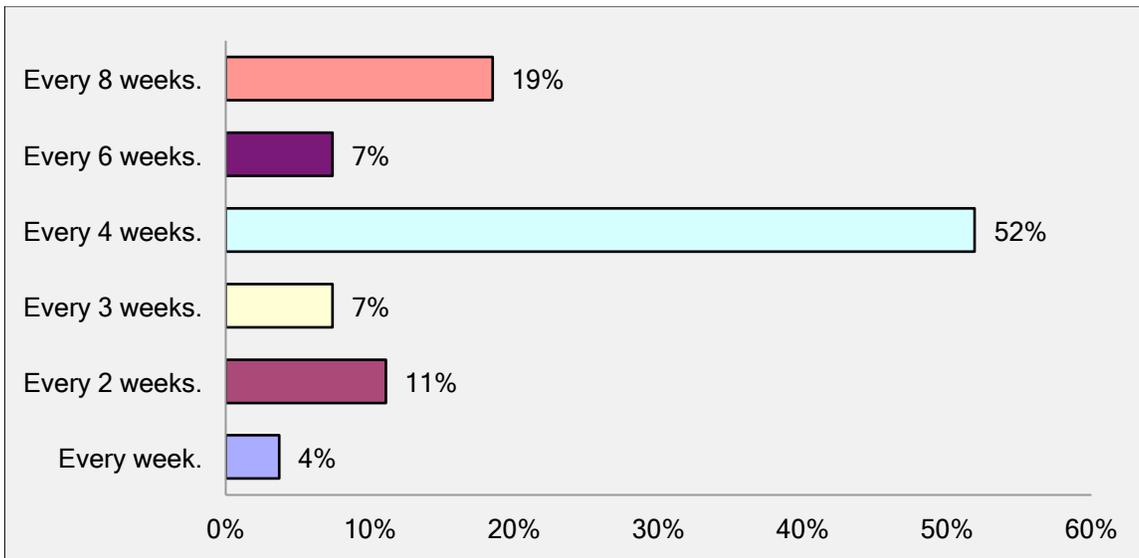
In 2012, 97% of farmers use soapy water in traps, 3% used a pest strip, and none used antifreeze.

**Q39 Research shows that 1:1 is as effective as 3:1 methanol to ethanol. What type of bait are you using?**



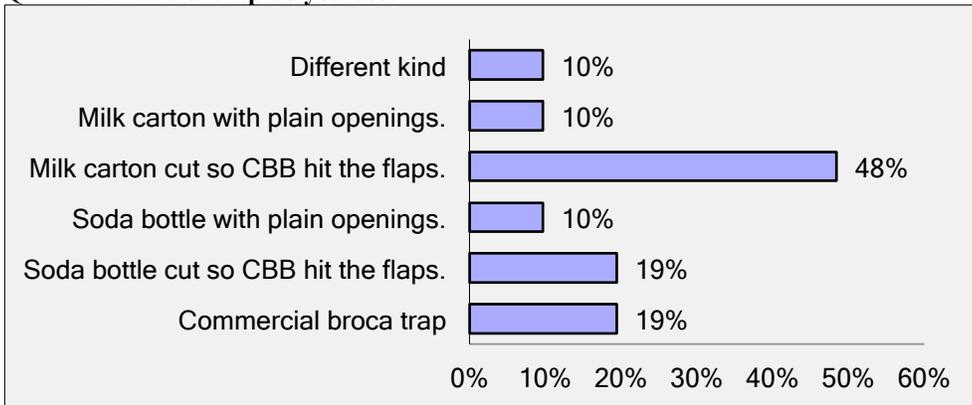
In 2012, 77% of farmers use 3:1 methanol: ethanol, 13% a 1:1 mix. If 1:1 is less expensive we should encourage resellers like Greenwell Farms to change their ratio?

**Q40 How often do you replace or refill the bait container.**



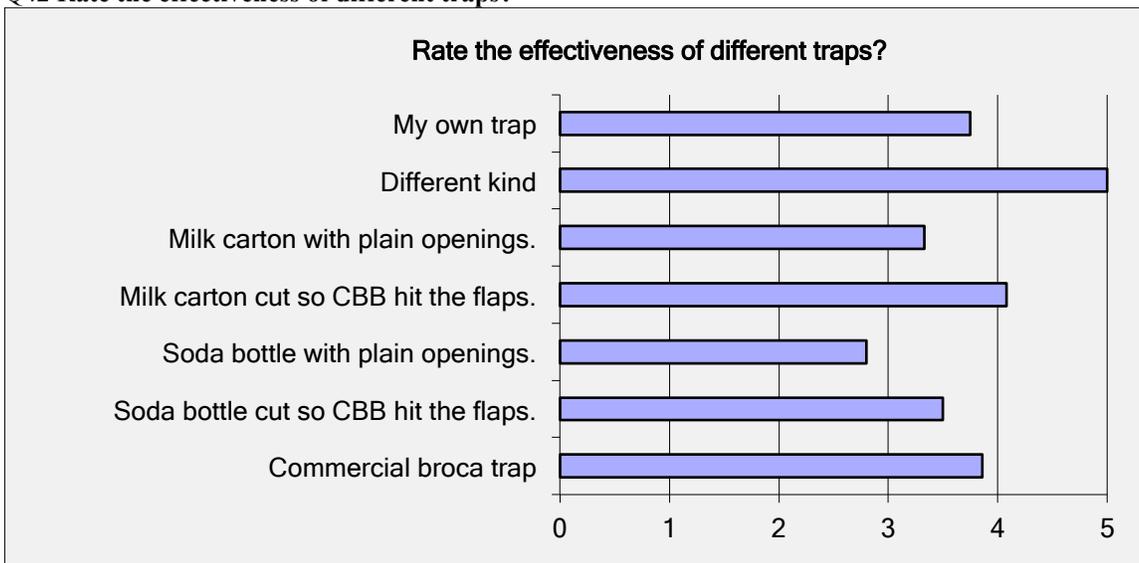
In 2012, 52% of farmers replaced bait in traps monthly, 26% at 6 and 8 wks and 24% at 2 and 3 wk intervals. This is similar to 2011.

**Q41 What kind of trap do you use?**



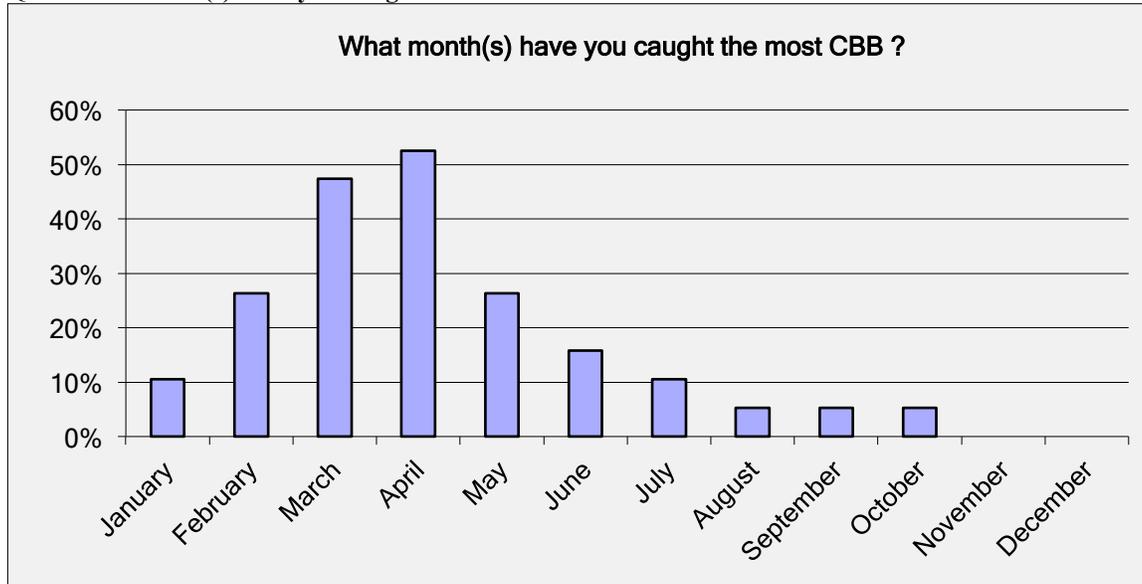
In 2012 86% of farmers use traps with flaps so CBB cannot fly through. This is big increase from 2011 when traps without flaps were more common. Commercial broca traps was used by 19%.

**Q42 Rate the effectiveness of different traps?**



In 2012, 86% of farmers rated traps with flaps as good to very good. From 2011, there has been wider acceptance of traps with flaps to prevent CBB from flying through the trap.

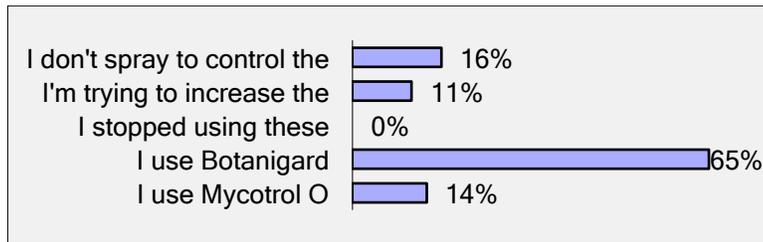
**Q43 What month(s) have you caught the most CBB ?**



In 2012, 50% of farmers indicated most CBB are caught in March and April, followed by February and May at 25 % .

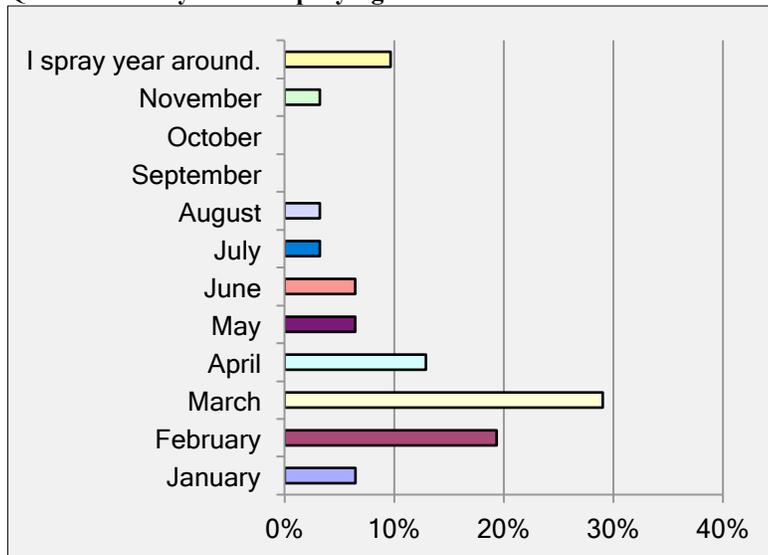
**Spraying the fungus to control CBB**

**Q44 Are you spraying commercial insecticides that contain spores of the fungus *Beauveria bassiana*?**



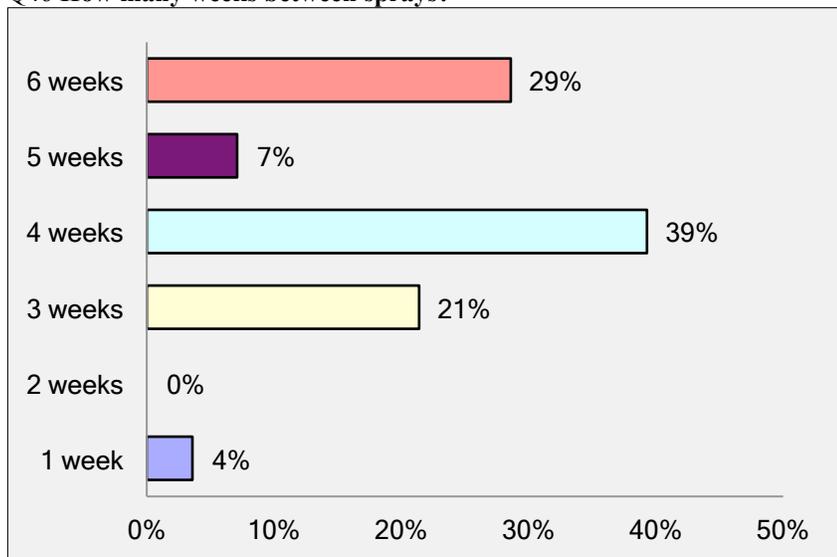
In 2012, 80% sprayed a commercial *Beauveria* fungus insecticide; Botanigard was 4 times more popular than Mycotrol O. 16 % don't spray. This is a slight improvement over 2011 when 75% sprayed *Beauveria* and 24% did not spray. One farmer imports less expensive *Beauveria* from India.

**Q45 When did you start spraying in the 2012-13 season?**



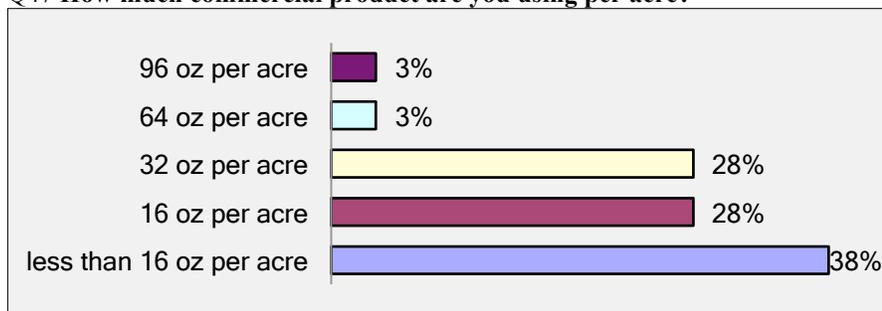
In 2012, 48% of farmers began spraying in February or March; 10% spray year around. In 2011, 18% started spraying May and 14% in April.

**Q46 How many weeks between sprays?**



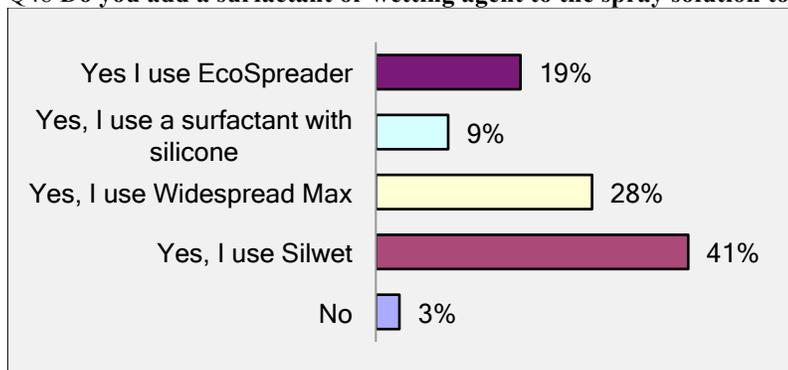
In 2012, 39% of farmers sprayed every 4 wks, 29% every 6 wks. In 2011, 27% sprayed every 6 wk followed by 20 % at 4 wk.

**Q47 How much commercial product are you using per acre?**



In 2012, 38% of farmers sprayed less than 16 oz of *Beauveria* per acre per application, 28 % used 16 oz, and 28% use 32 oz. In 2011 most sprayed 32 oz per acre. *Beauveria* rate per acre per application is decreasing while applications per acre per year are increasing due to more frequent spraying.

**Q48 Do you add a surfactant or wetting agent to the spray solution to better penetrate the CBB holes in the cherries?**



97% of farmers who spray, use a silicone based surfactant.

**Q49 If you use a surfactant or wetting agent, how much surfactant do you use**

A typical spray solution is 0.3% surfactant, 4 oz in 24 gallon spray solution.

**Q50 How much spray solution do you apply (gallons per acre)?**

Rate averages 40 gal /acre, but 25% reported using 12 gal or less per acre.

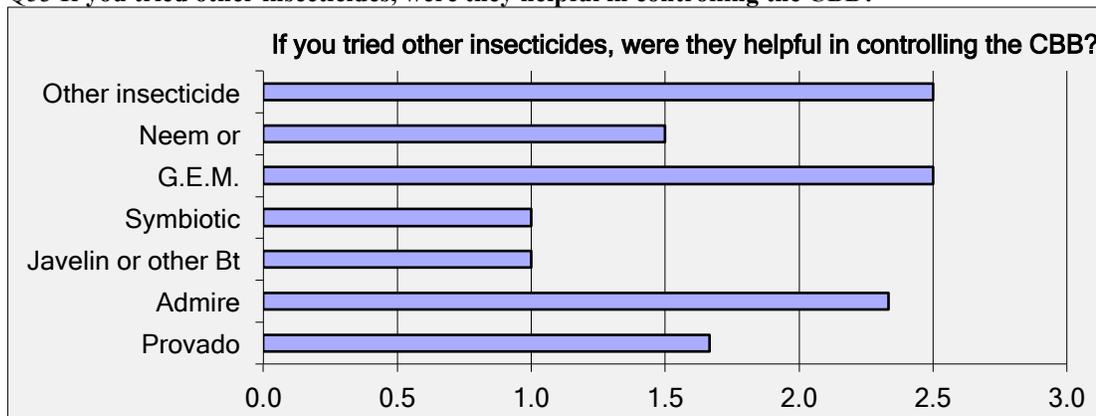
**Q51 What type of sprayer do you use?**

50% of farmers who sprayed, use a mist blower followed by 39% using a motorized pump. This is an increase of mist blower and motorized pump sprayer over 2011.

**Q52 Is spraying Botanigard ES or Mycotrol O effective for you?**

55% of farmers felt the effectiveness of spraying *Beauveria* was very good or good. This is an increase from 2011 when 40% felt spraying was good to very good.

**Q53 If you tried other insecticides, were they helpful in controlling the CBB?**



Most farmers have not tried other insecticides, but in 2012 more tried than in 2011. Those that did rated Admire and G.E.M. as somewhat effective. Also mentioned were wetable sulfur and Kaolin (Surround). 2011 and early 2012 research results in Hawaii with Surround (kaolin clay) were very encouraging, when sprayed every 2 weeks.

**Questions about farmers leaving coffee due to CBB.**

**Q56 Are you planning to stop growing coffee because of CBB?**

Only 3% of farmers responding are considering getting out of coffee.

**Q57 How many farmers do you know have stopped farming coffee?**



58% of farmers reported no one was quitting coffee, while 19% knew of five, and 10% knew of 10 farmers quitting.

**Questions about abandoned farms and feral coffee.**

**Q58 Does your farm border a farm that is not trying to control CBB?**

60% of farmers have adjacent farms not trying to control CBB.

**Q59 Does your farm border an area with wild, feral or abandoned coffee?**

50% of farms border areas with feral or abandoned coffee.

**Q60 Do you or someone you know need information on how to kill unwanted coffee trees?**

34% knew of someone who needed information to kill coffee trees.

**Q61 Where do you get information to control CCB?**

Important sources of information to control are: other farmers (84%), farmer's coffee organization website (68%), CTAHR workshops (66%), CTAHR website (63%), and my coffee organization workshops (60%). Compared to 2011, CTAHR sourced information is increasing in importance.