What's Going on with Coffee in Hawaii

2011-2012

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Outline

1. Introduction of CBB in Hawaii
2. Non-scientific observations of CBB
3. 2011 Survey

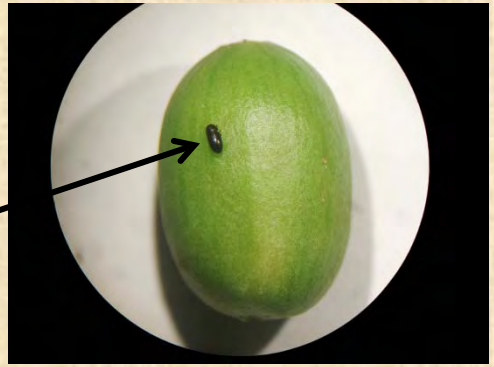
Please hold your questions…There will be a question and answer session following the presentations.

Coffee Berry Borer

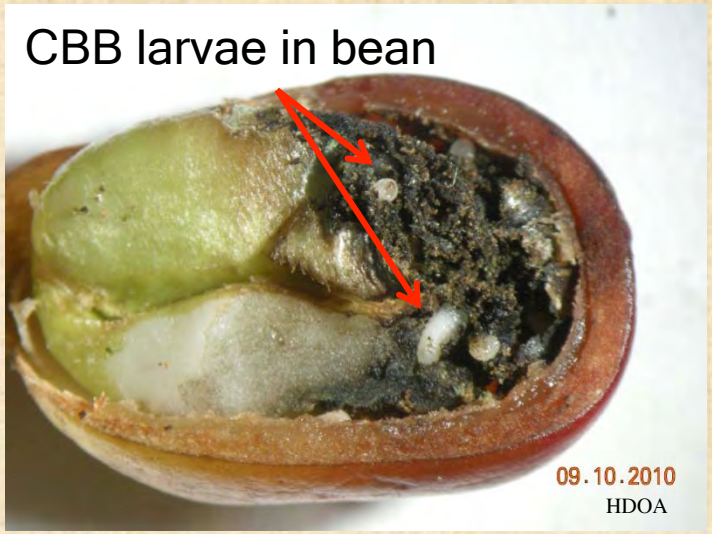
- Small dark brown to black beetle about 1.5mm
- Bores holes into the cherry and bean

- Identified in Kona - Sept. 2010
- Identified in Ka'u – May 2011

CBB on a green coffee cherry



CBB holes



CBB damaged cherry

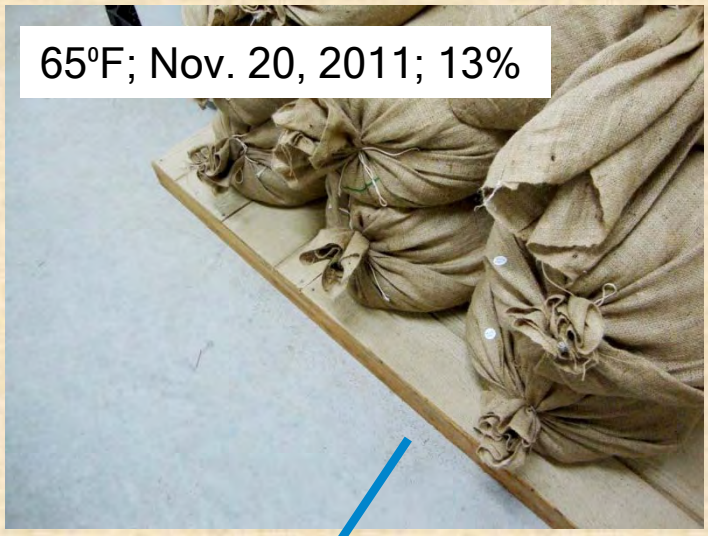
Where is the CBB?

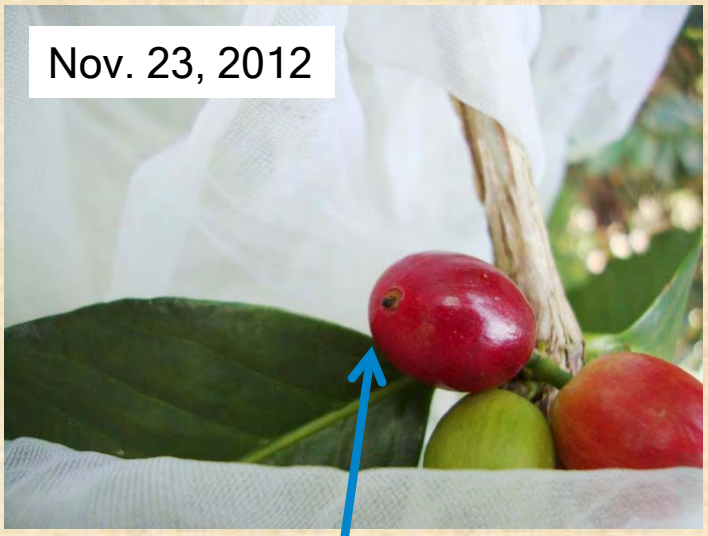
- Distribution of CBB in Kona
  - Kaloko to Milolii
  - <600 feet to >2,200 feet
- Most farms are experiencing CBB damage
  - Range < 1% to >90%
- CBB in Pear Tree and Wood Valley in Ka'u
- No current confirmations of CBB-free farms in Kona
- No CBB – YET!
  - East and North Hawaii Island
  - Oahu, Maui, Molokai and Kauai

CBB Observations

*Reminder: These are observations and not scientifically published data.


65°F; Nov. 20, 2011
Jan. 4, 2012





Jan. 14, 2012
(53 days later)

Live CBB
and larvae

LIVE CBB!

CBB infested parchment with 12.3% moisture content held at room temperature

Dropped, dried cherry and beans in the field

Uninfected cherry can become infested by CBB on the ground

Mahalo!

- Roger Rittenhouse
- Bob Nelson
- Roger Kaiwi
- Marc Meisner
- Kelly Asai
- Dr. Loren Gautz
- Andrew Bowles
- Dr. Mike Kawate

2011 CBB Survey of Farmers and Processors

HC 'Skip' Bittenbender, Andrea Kawabata and Elsie Burbano
UH/ CTAHR extension specialist, extension agent, entomologist

Purpose of the survey is to learn about farmers' experiences in controlling the coffee berry borer (CBB) since it was found in 2010.

Survey organization

Questions and conclusions about farm location, elevation and management.

Questions and conclusions about CBB damage in 2010 and 2011, whether the farmer perceives that damage is increasing, same, or decreasing over the 2011 harvest.

Questions and conclusions about how the farmer is implementing the three strategies: sanitation during harvest and pruning, trapping, and spraying the bio-insecticide Beauveria bassiana.

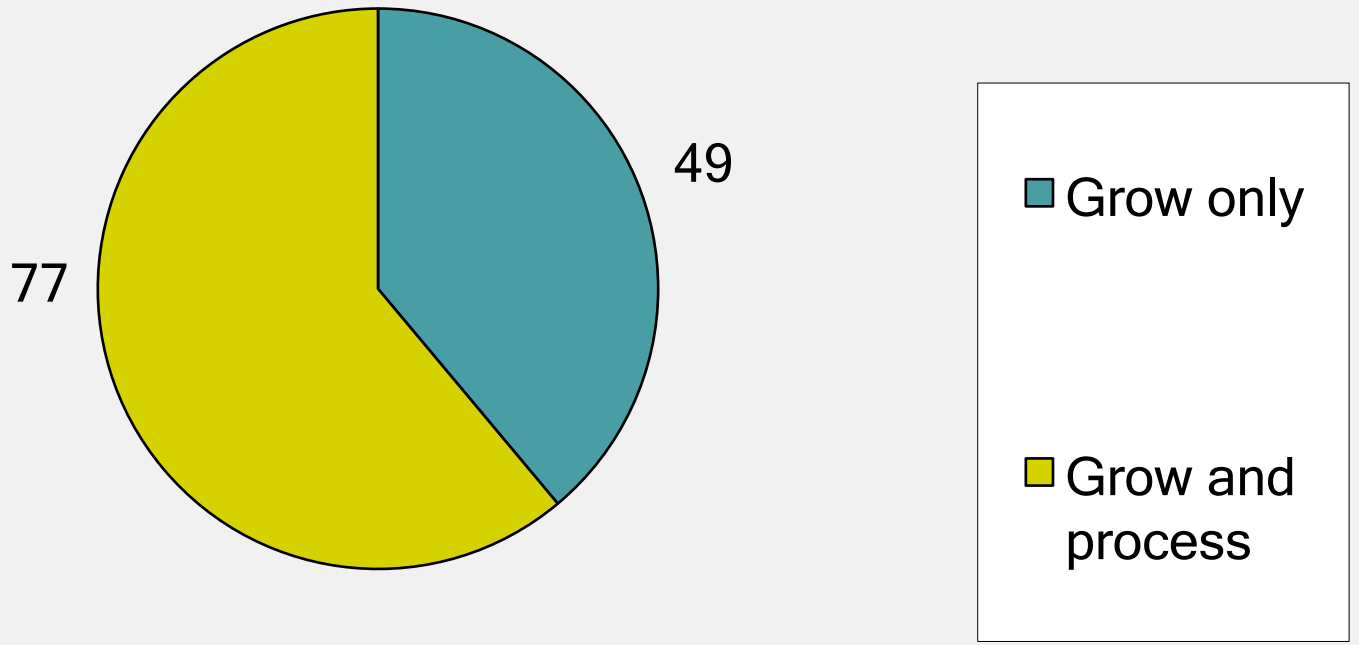
Responses to the strategies were evaluated by comparing responses based on the farmers' perceptions of increasing, no change or decreasing CBB damage.

Reported damage was evaluated for effect of elevation.

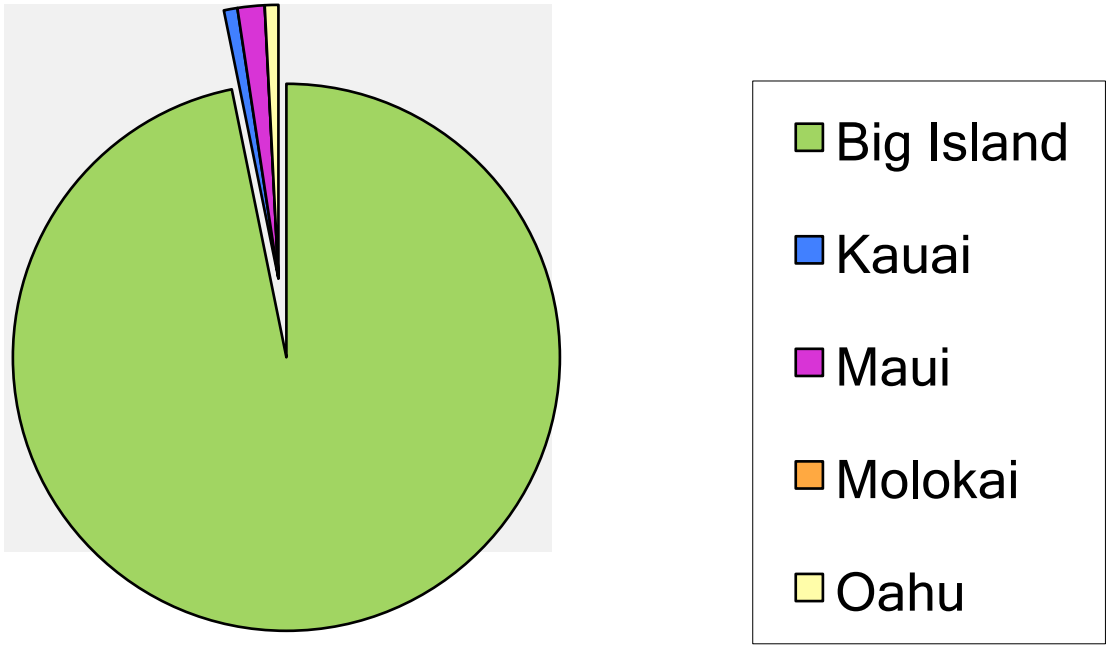
Questions about where farmers go their information on CBB control.

Final conclusions.

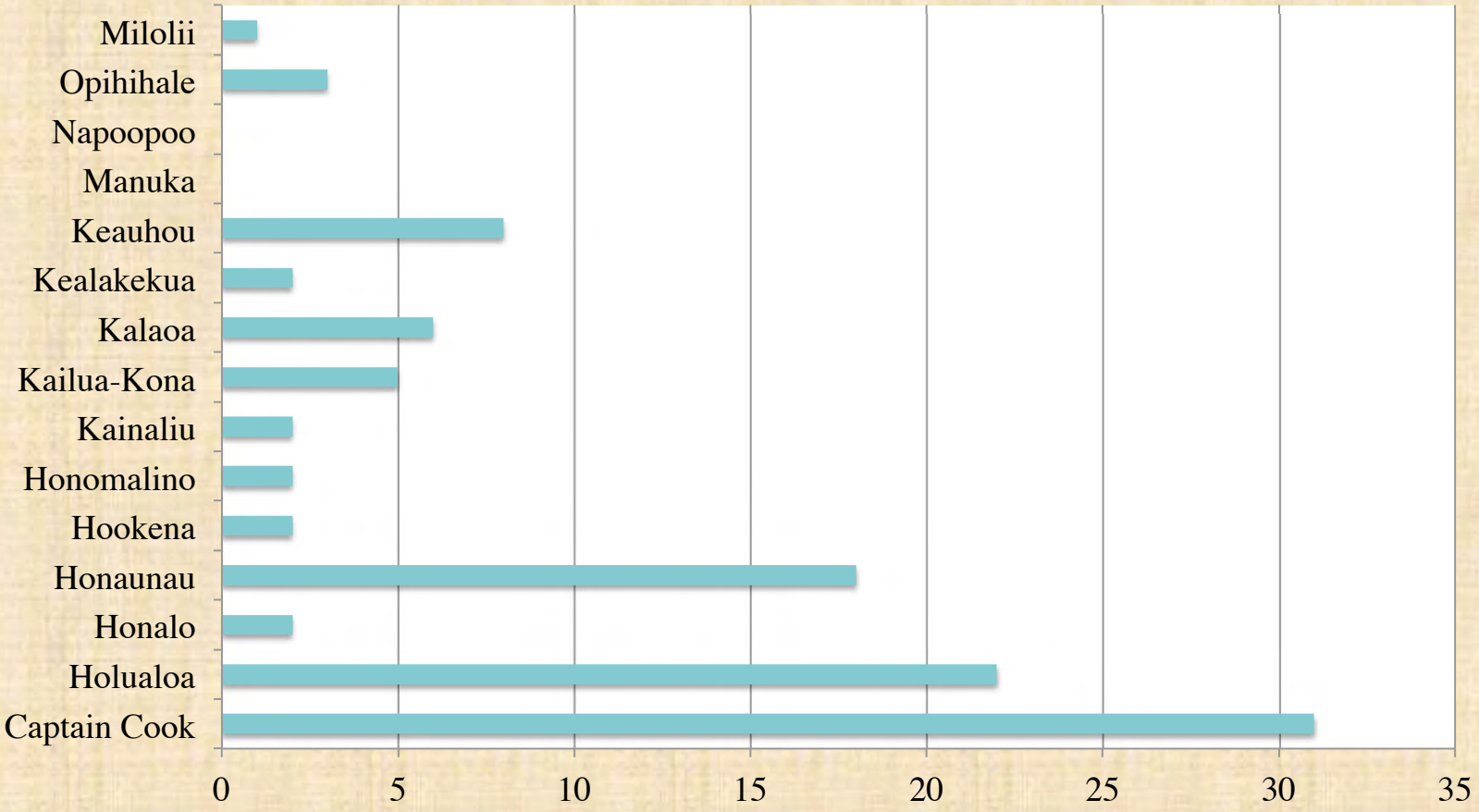
Do you grow coffee, process coffee, or both?



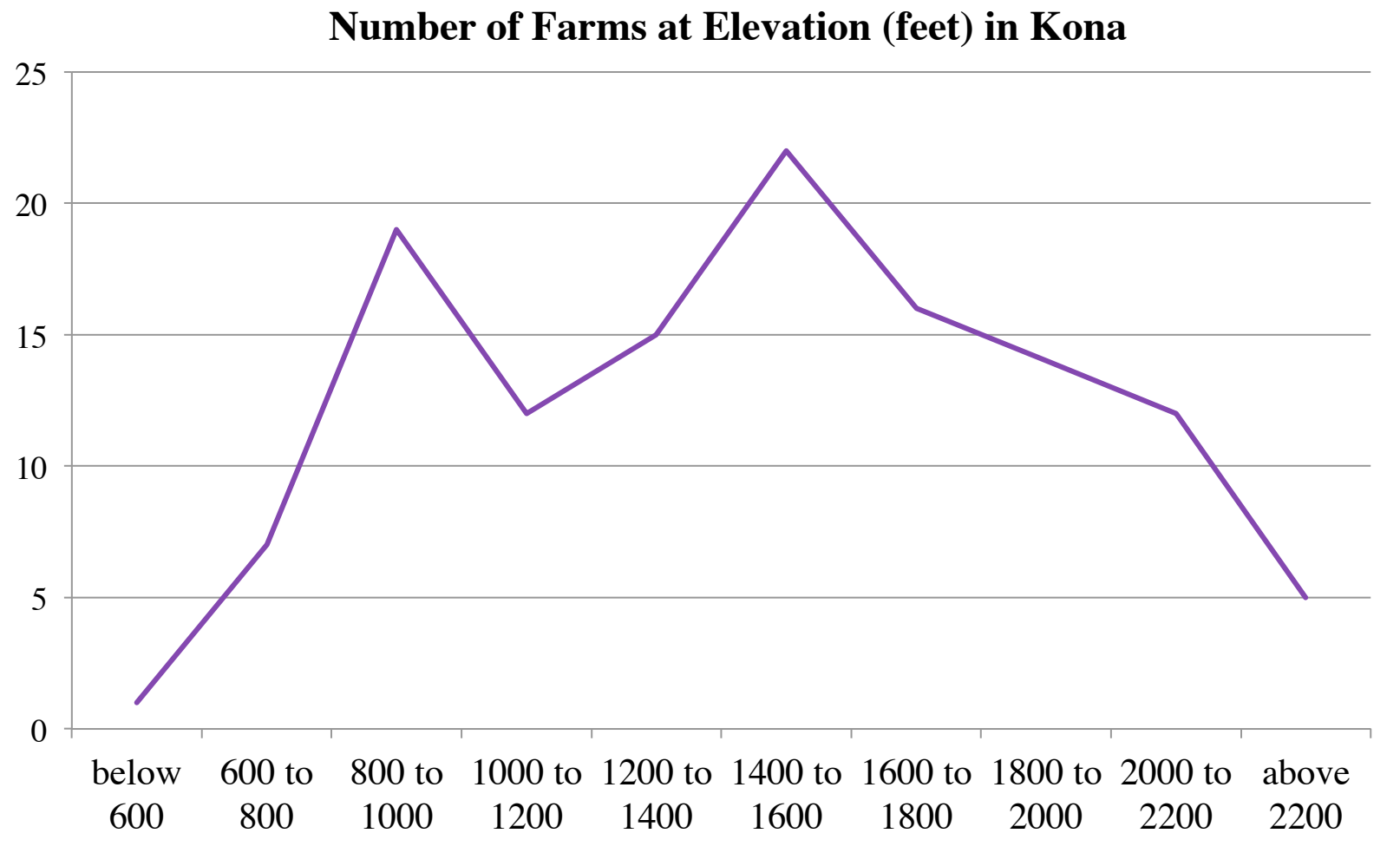
On which island are you farming and /or processing coffee ?



Coffee Farms in Kona

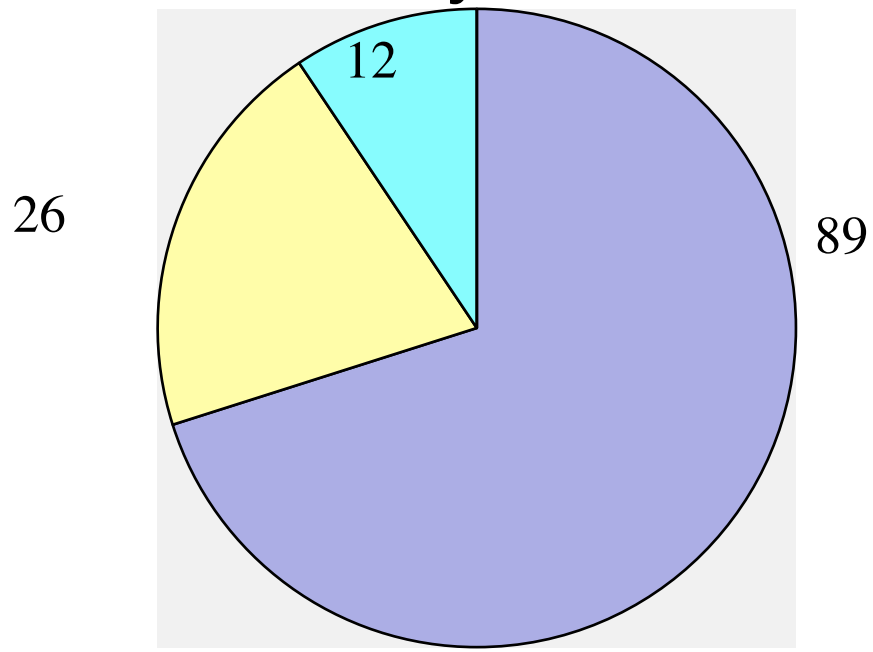


104 farmers responded with the location of their farms.

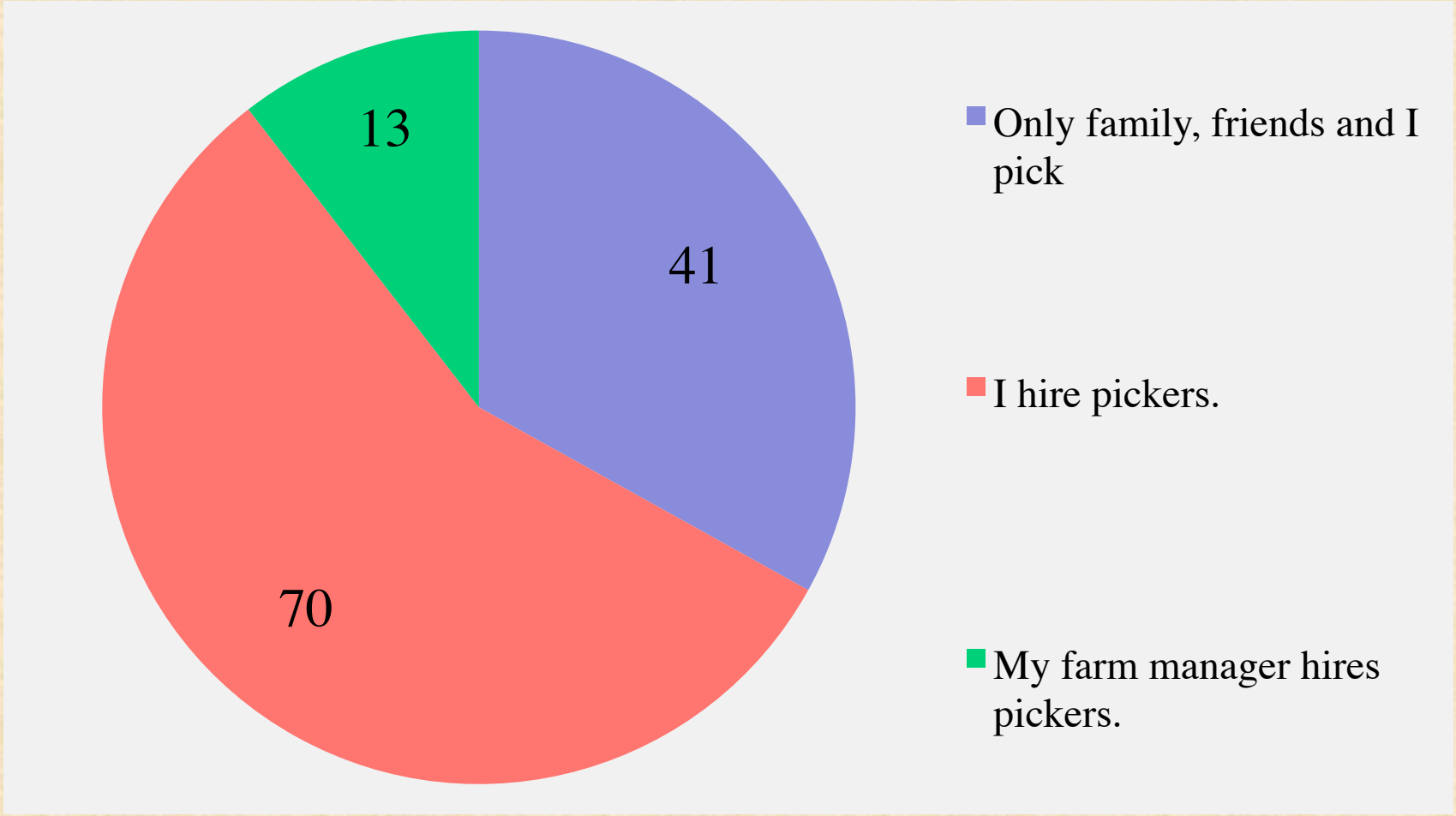


The average farm was 6.2 acres. If answered by tree count the average farm was 4.4 acres.

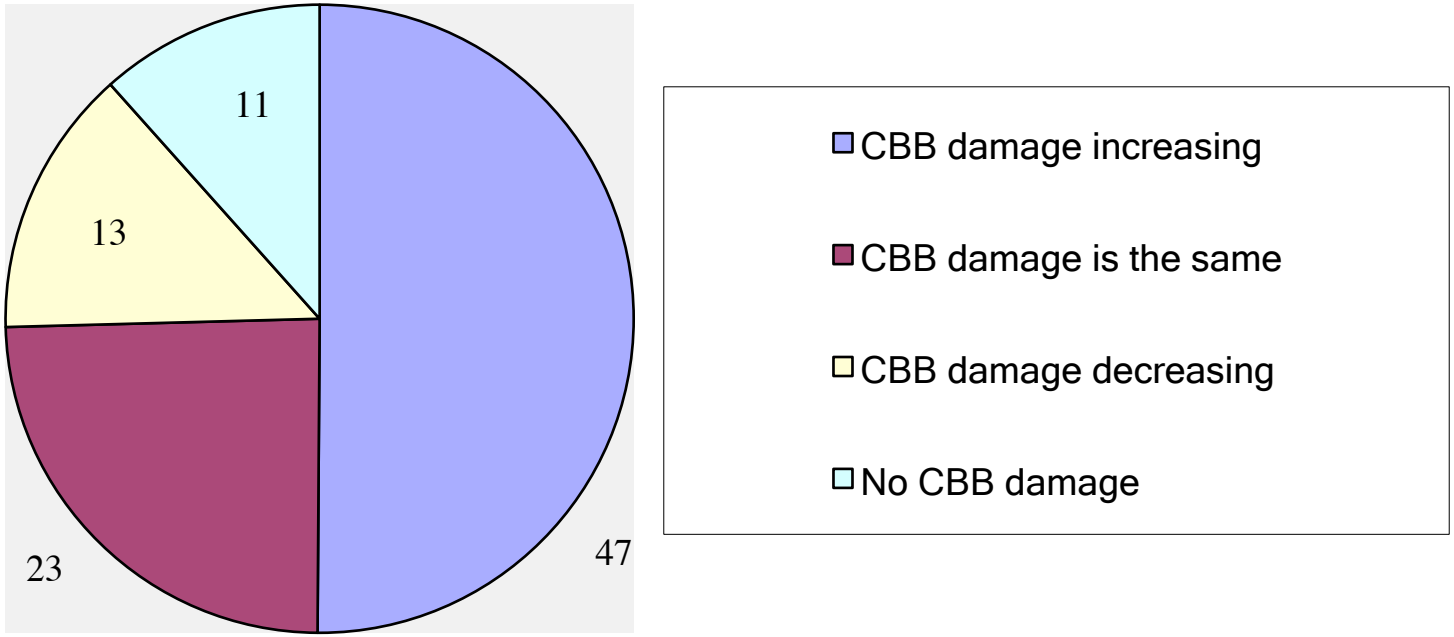
What type of farming methods do you use?



Who picks your coffee?

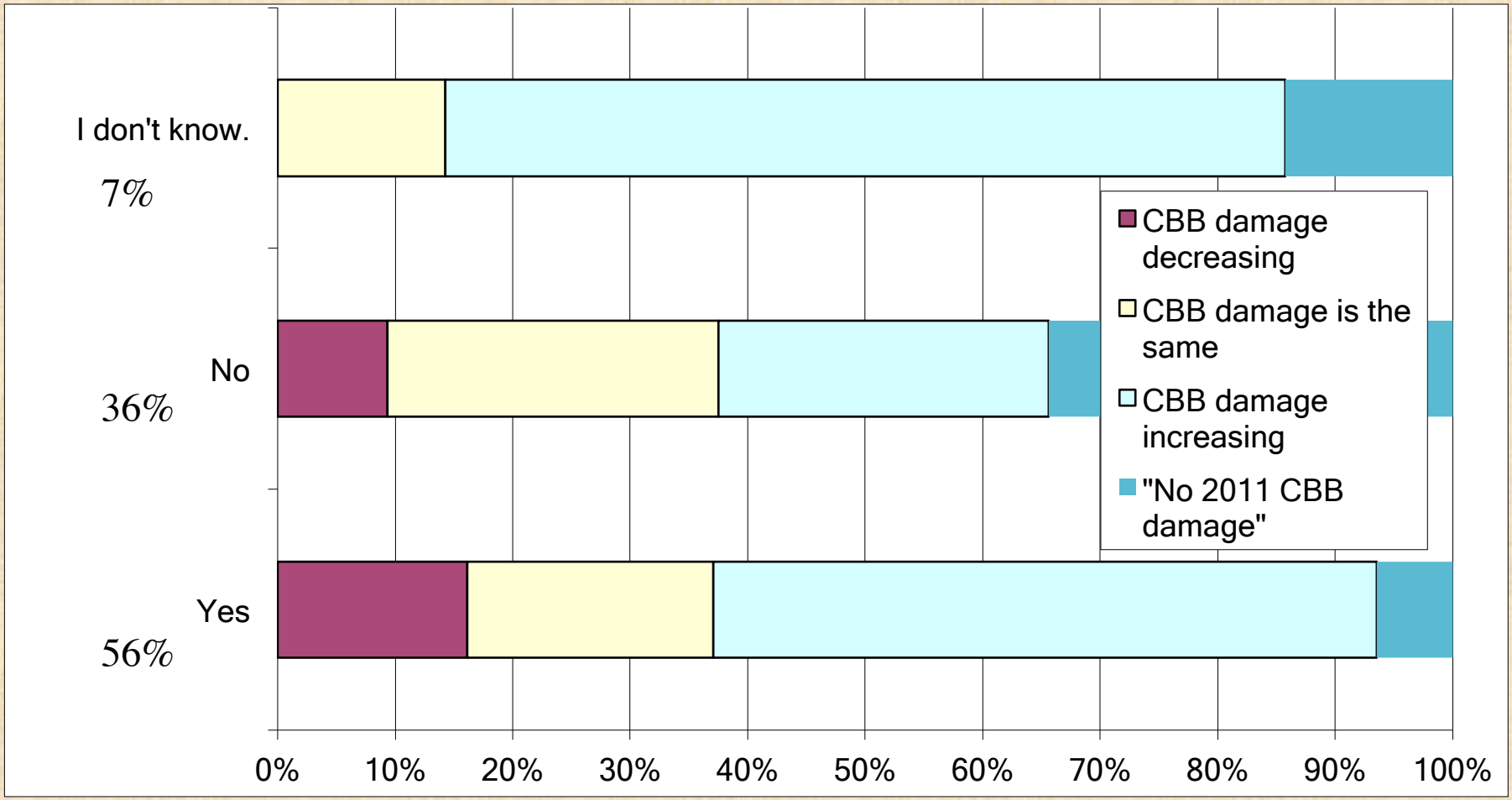


Compare your CBB damage in the first harvest round with your most recent harvest round in 2011-2012.



***We then compared what these 4 groups of farms did to control CBB to see if we could explain why some farms were experiencing increasing damage and others decreasing damage. REMEMBER these are farmers' perception – we don't have the numbers.

Did you have CBB on your farm in the 2010 season?



What was your normal green bean recovery ratio, **before CBB arrived** ?
(Calculated: fresh cherry weight divided by marketable green bean weight)

30% responded 5.0 or less — 49 respondents
22% responded 5.1 to 5.5
48 % responded greater than 5.6

What was your **last season's (2010)** marketable green bean recovery ratio?

34% responded 5.0 or less — 55 respondents
22% responded 5.1 to 5.5
44 % responded greater than 5.6

Estimate **this season's (2011)** marketable green bean recovery ratio?

21% responded 5.0 or less — 42 respondents
26% responded 5.1 to 5.5
52% responded greater than 5.6

***Lack of difference in Marketable Green Bean ratio – MGBR – between a normal year and 2010 is puzzling considering the average cherry, parchment, and green bean damage in 2010!! However the 2011 crop MGBR clearly shows that CBB damage is increasing the MGBR.

Farmers estimate CBB damage 2010 vs. 2011

"If you had damage from the CBB in the 2010 crop, estimate the amount of damage to cherry, parchment, and green bean."

average of 66 was 15% cherry damage
average of 35 was 11% parchment damage
average of 35 was 13% green bean damage.

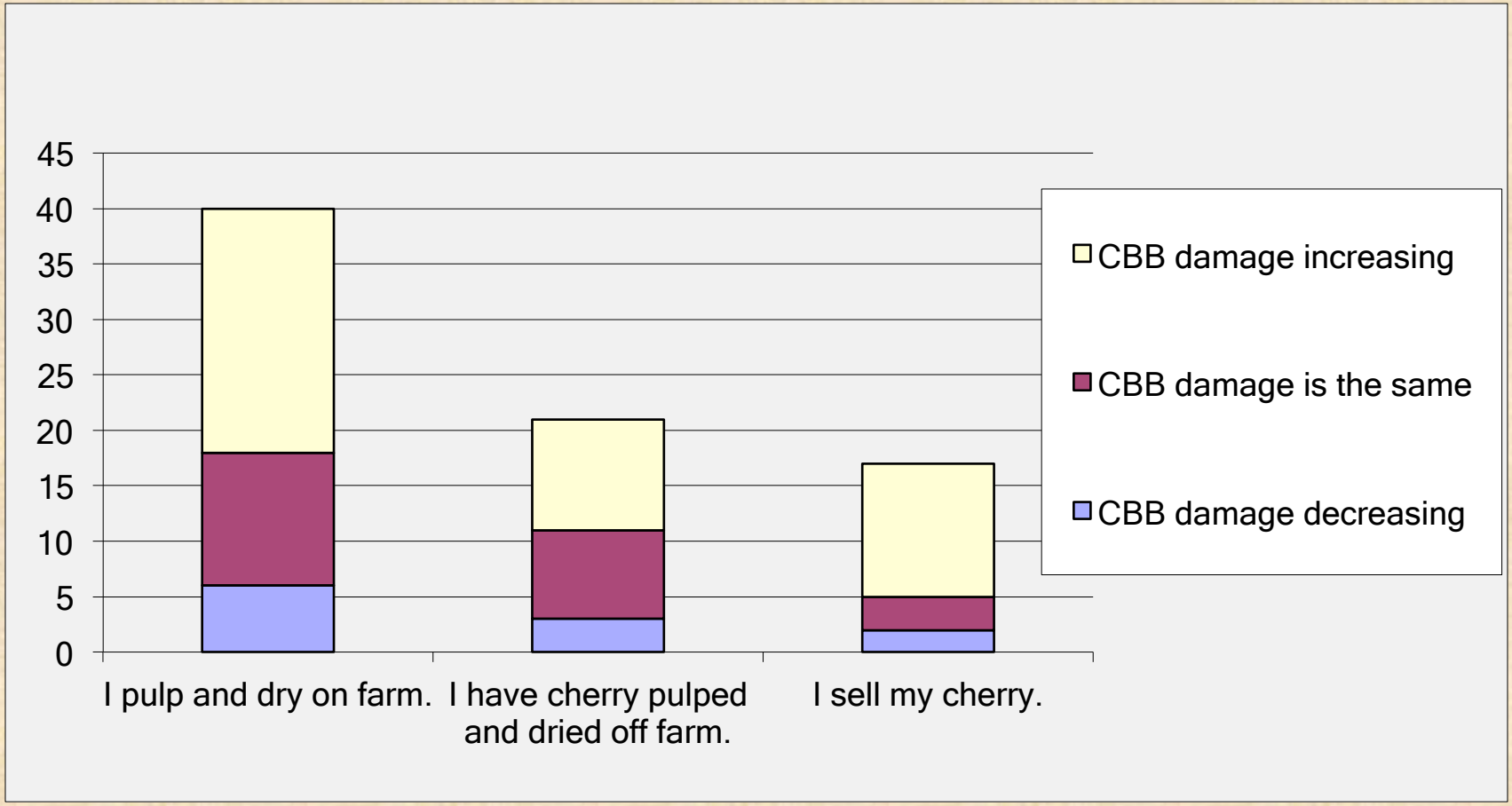
"What do you think will be the percent CBB damage on your farm this season 2011?"

74% responded they knew how much CBB damage they had this 2011 season.

average of 59 was 18% cherry damage.
average of 32 was 11% parchment damage.
average of 32 was 10% green bean damage.

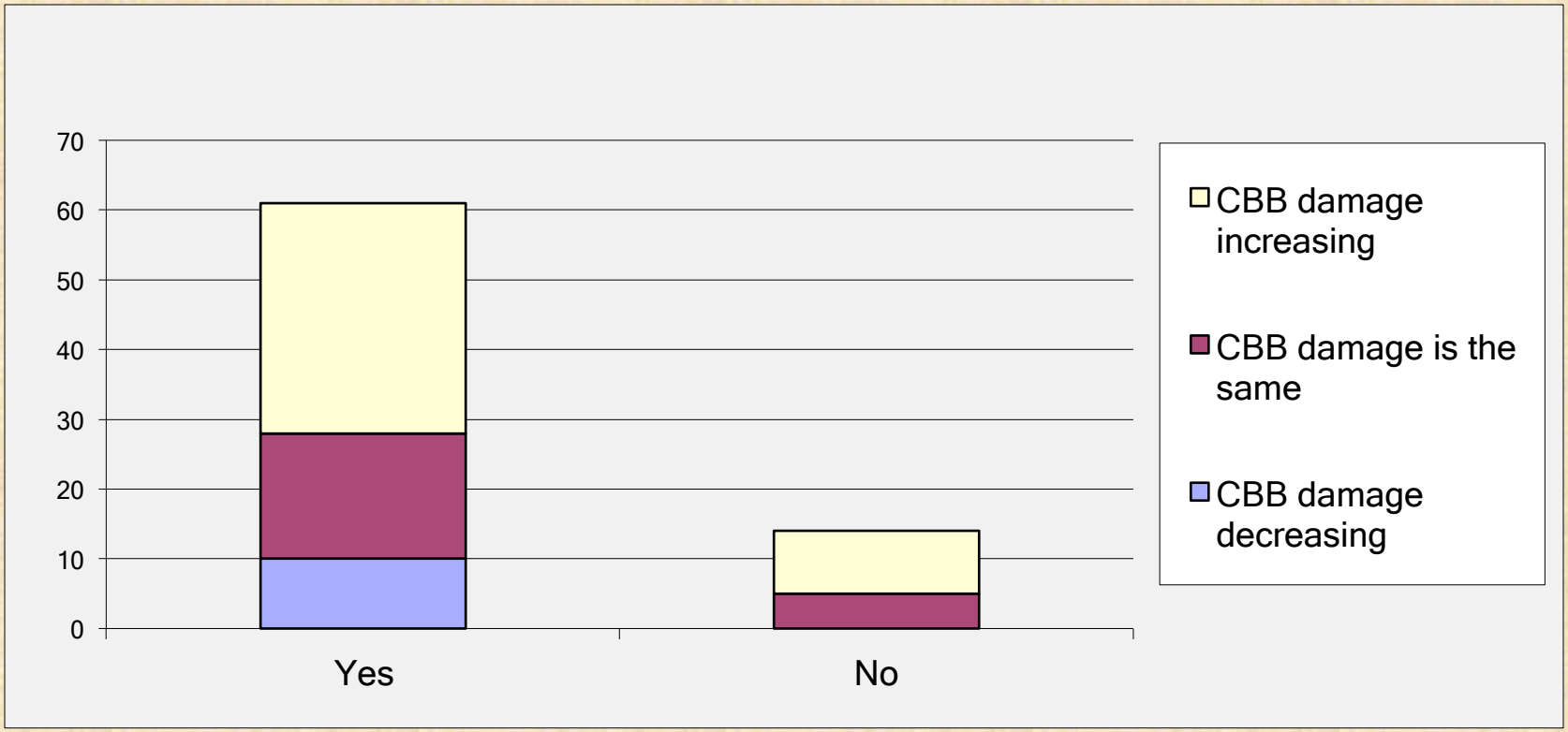
The damage estimates for 2010 and 2011 are similar, and suggest that CBB damage may have peaked in response to farmers efforts to control it.

After picking, what happens to your cherry?



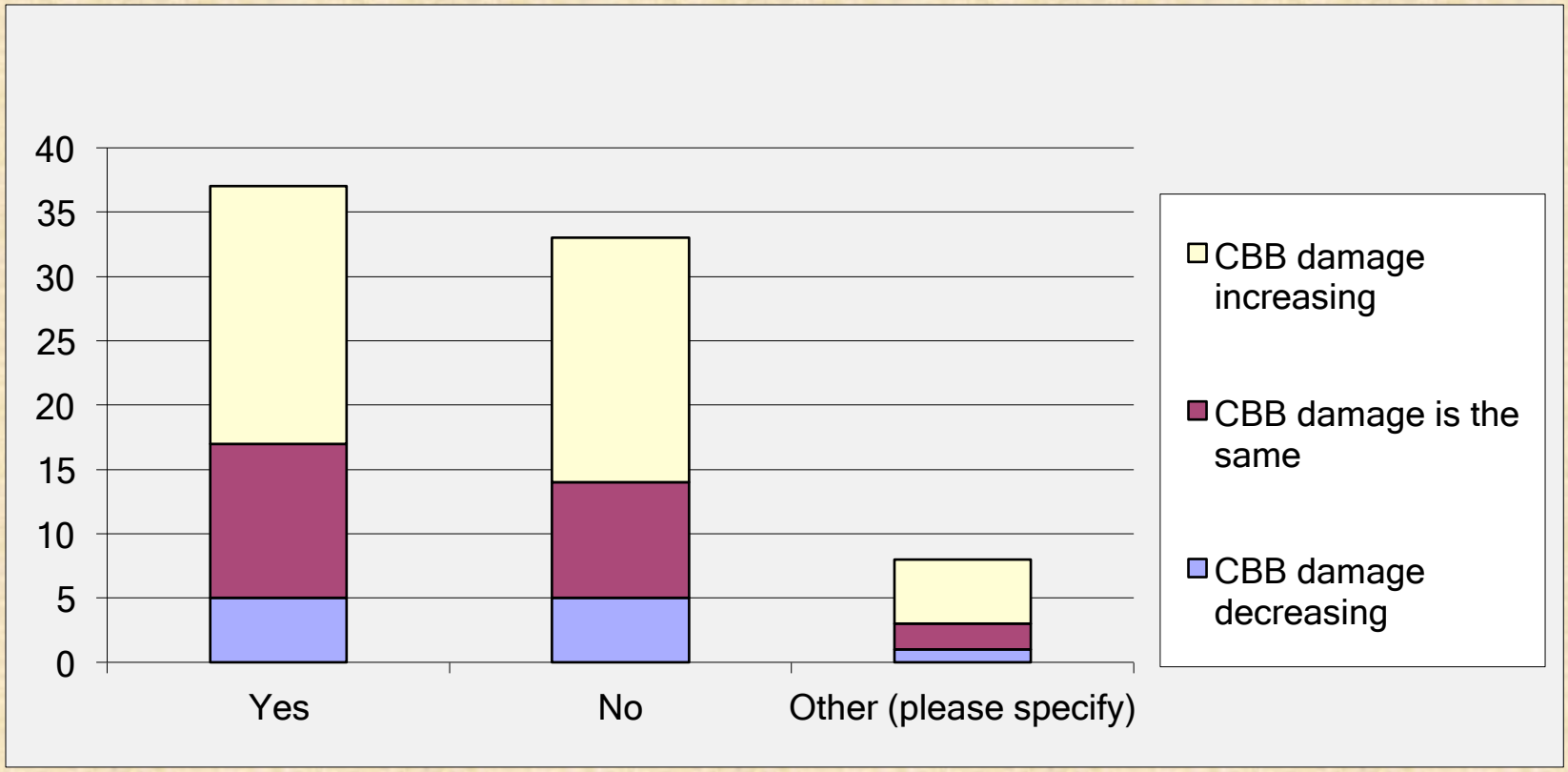
Cherry sellers may experience more damage; no apparent differences between farms that do on vs. off farm processing in CBB damage.

Do you and your pickers make an effort NOT TO DROP cherries when picking?

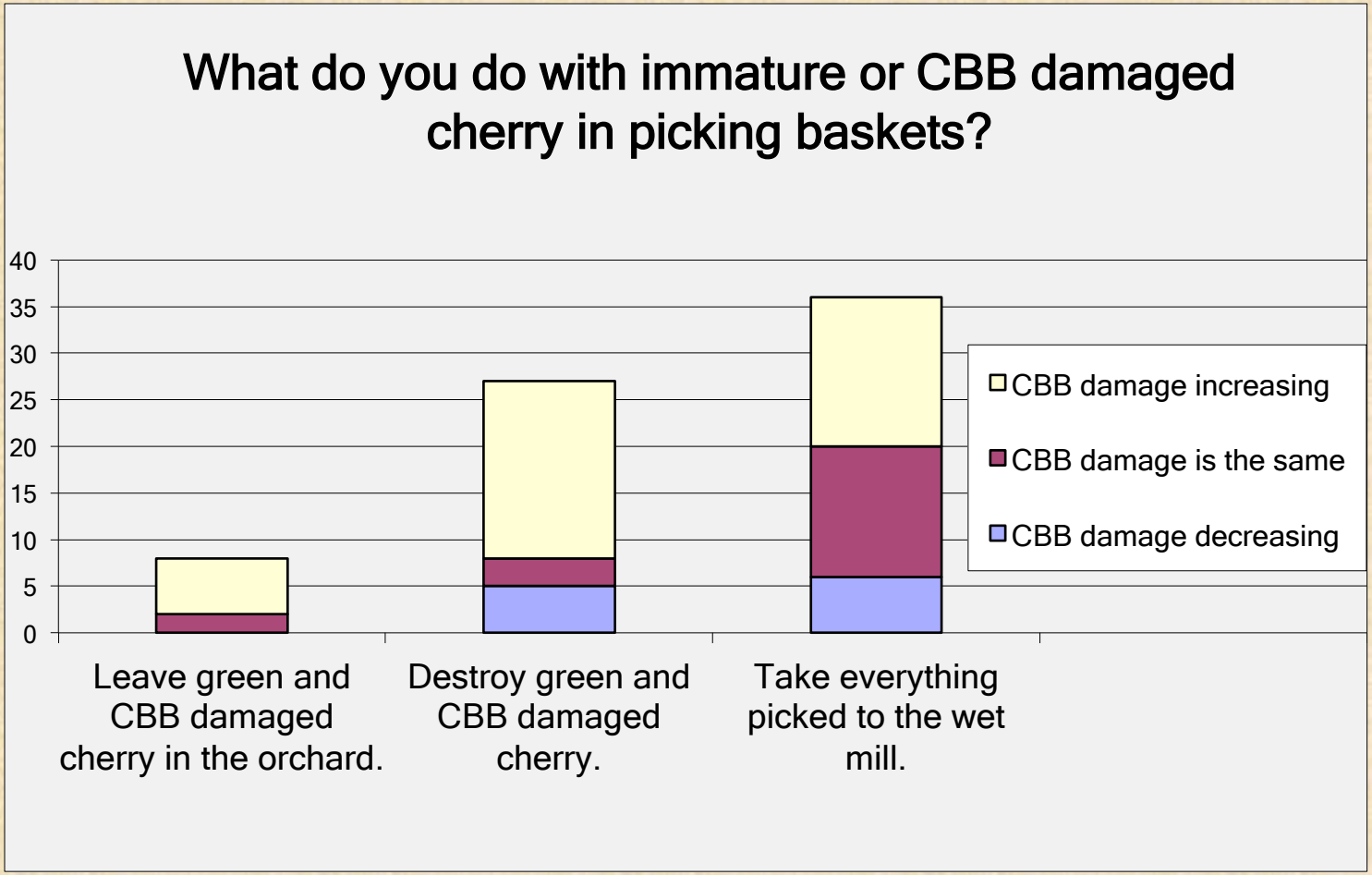


Not dropping cherry seems to help reduce damage.

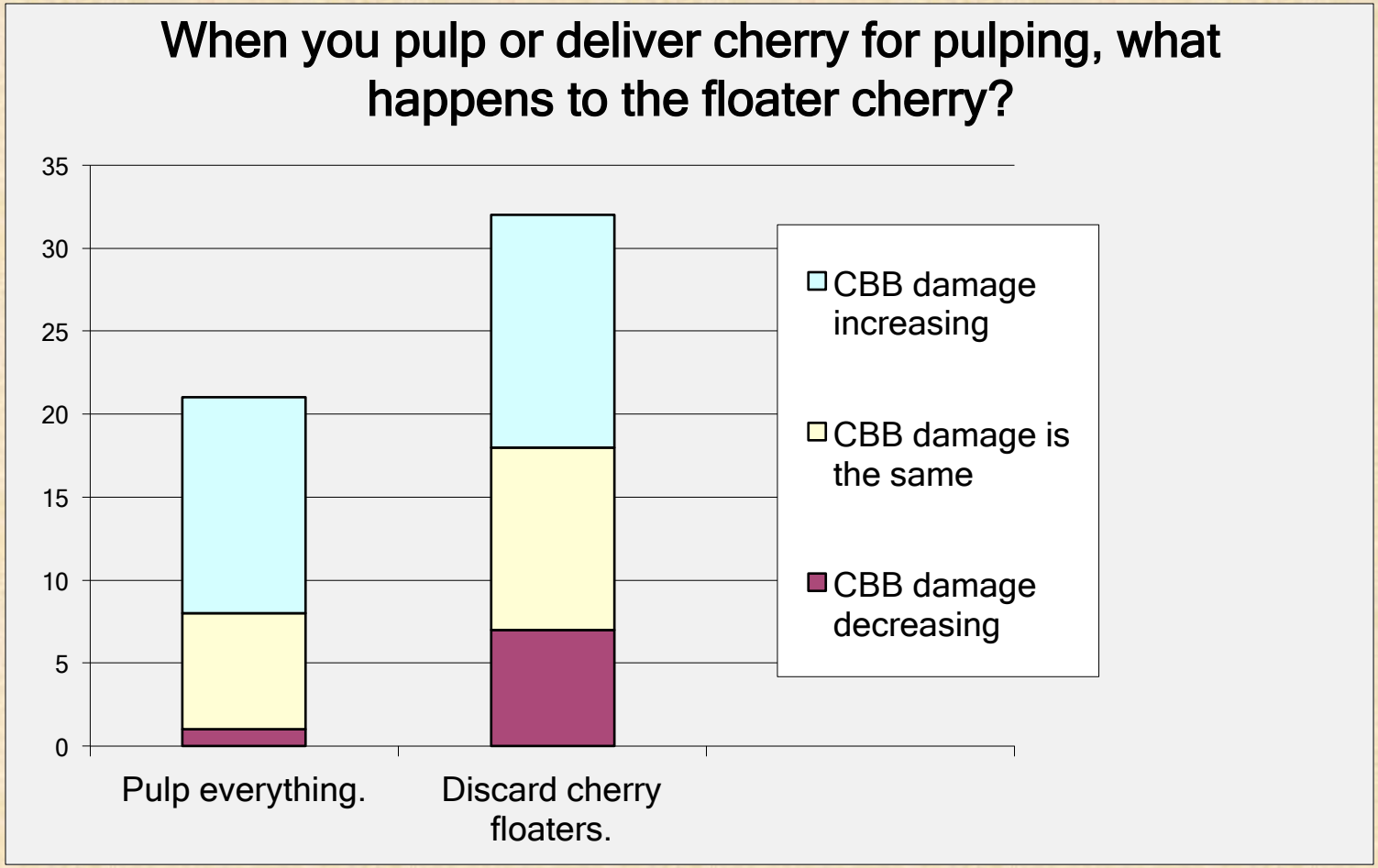
Do you and pickers make an effort to Pick Up Dropped Cherry ?



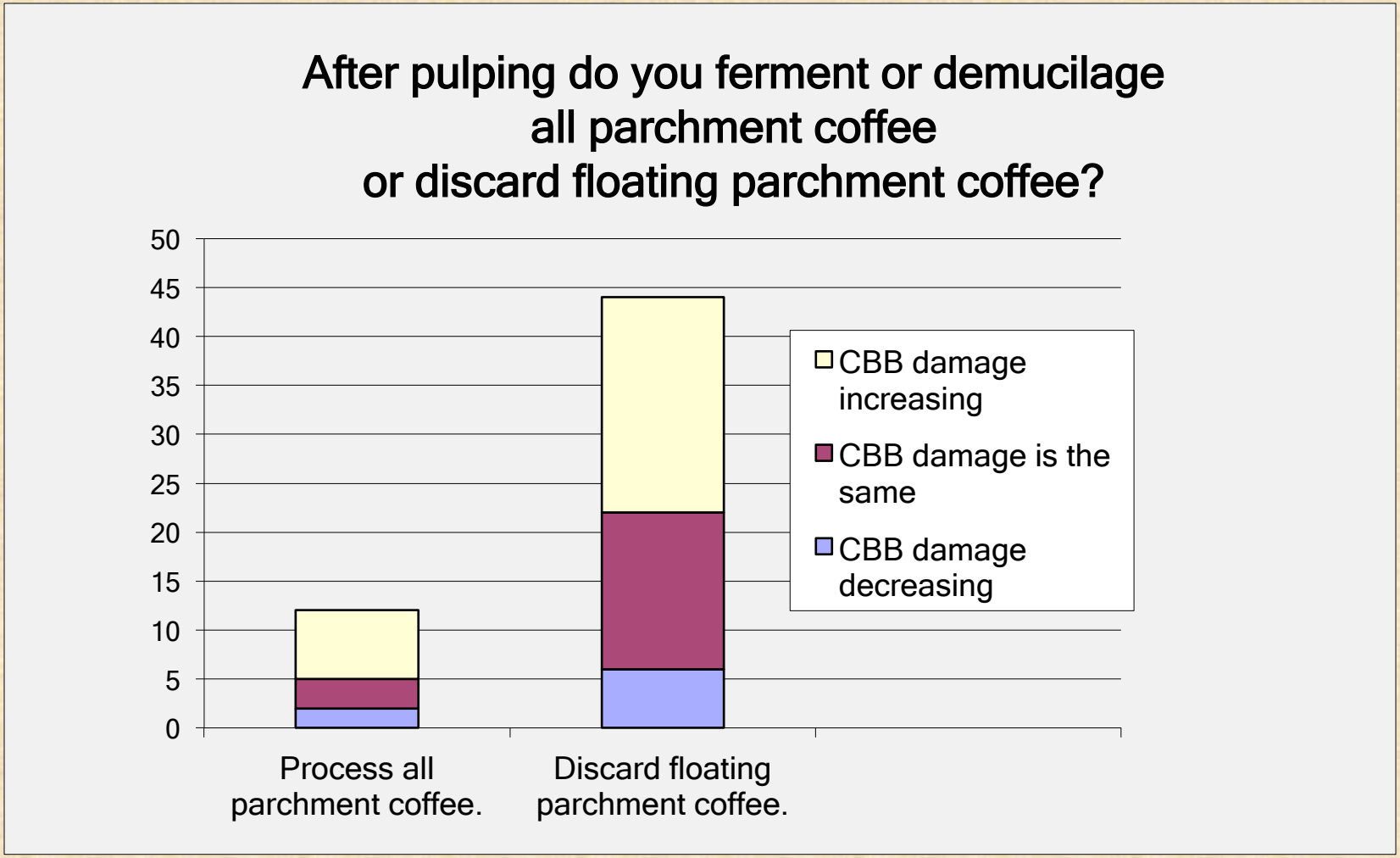
Picking up dropped cherry didn't seem to make a difference. But farmers say is very difficult to do. Reducing the number of dropped, infested cherry remaining in the orchard after each harvest round is mentioned to be very effective when most dropped is removed. Using drop cloths under trees and more efficient baskets should be attempted.



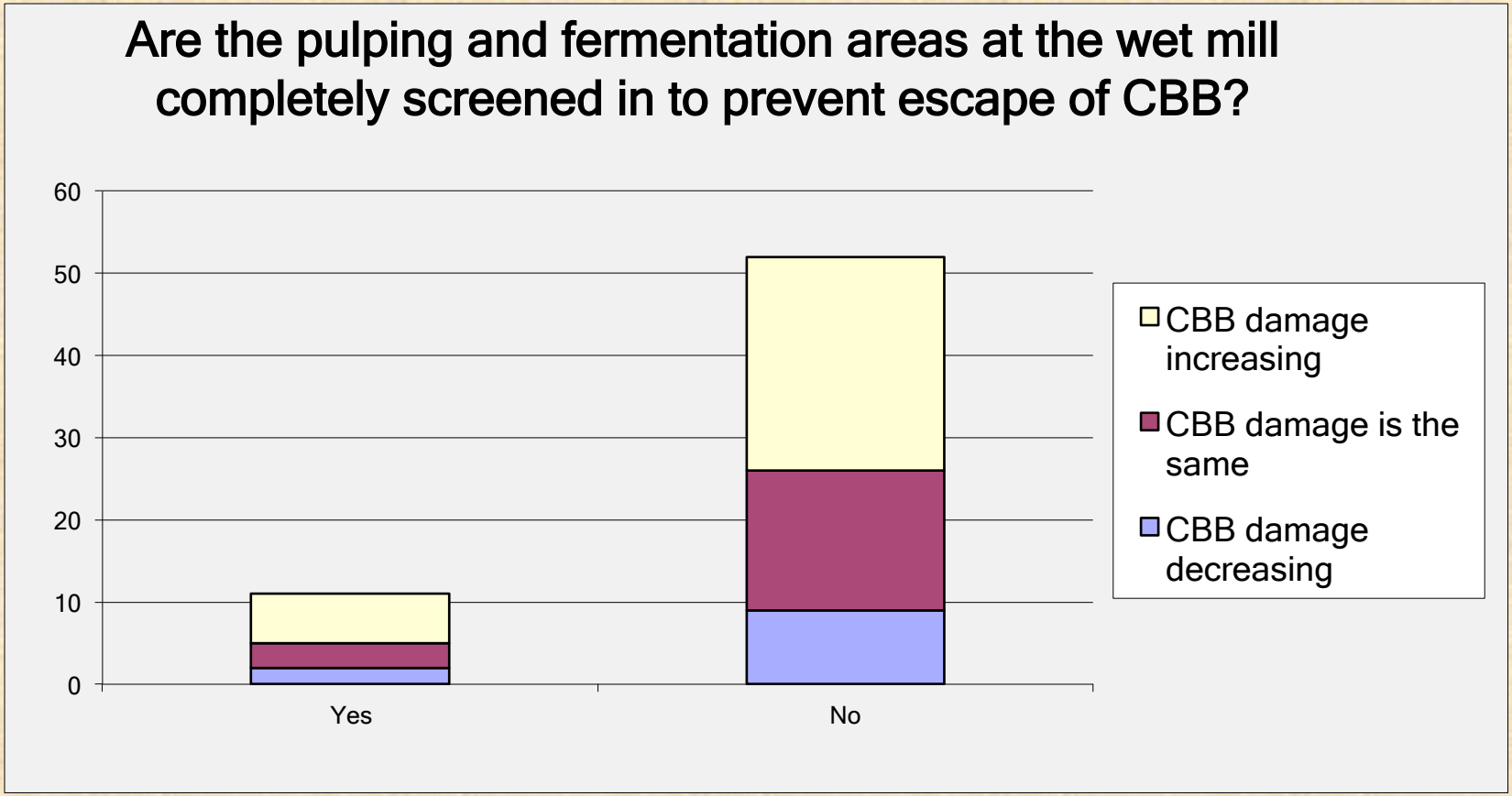
Few farms leave green or damaged cherry in orchard.
Processing all cherry appears to reduce damage.



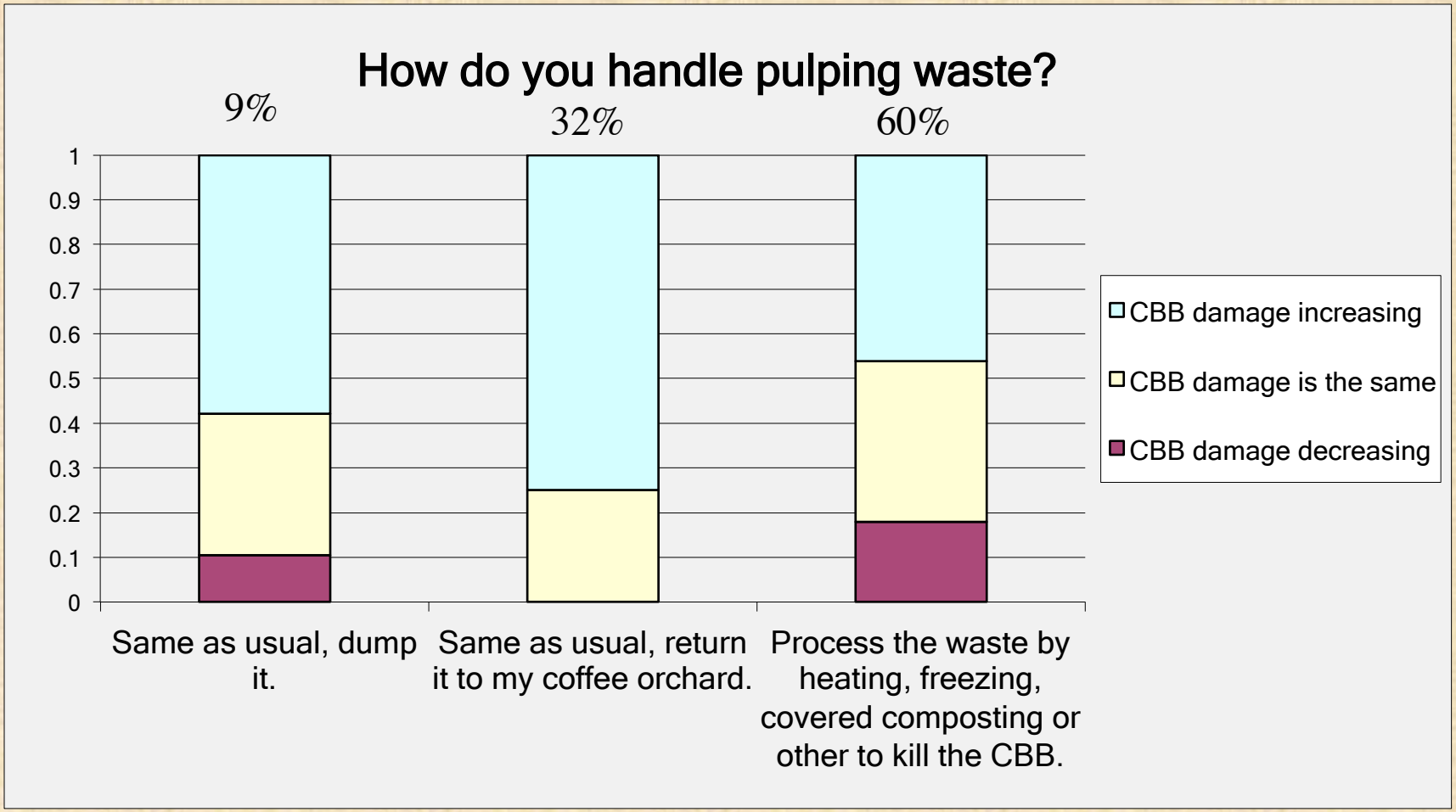
Discarding cherry floaters reduced perceived CBB damage, but cherry floaters frequently contain one good seed. Pulping everything and disposing of immature and floating parchment will save undamaged green bean in floating cherry.



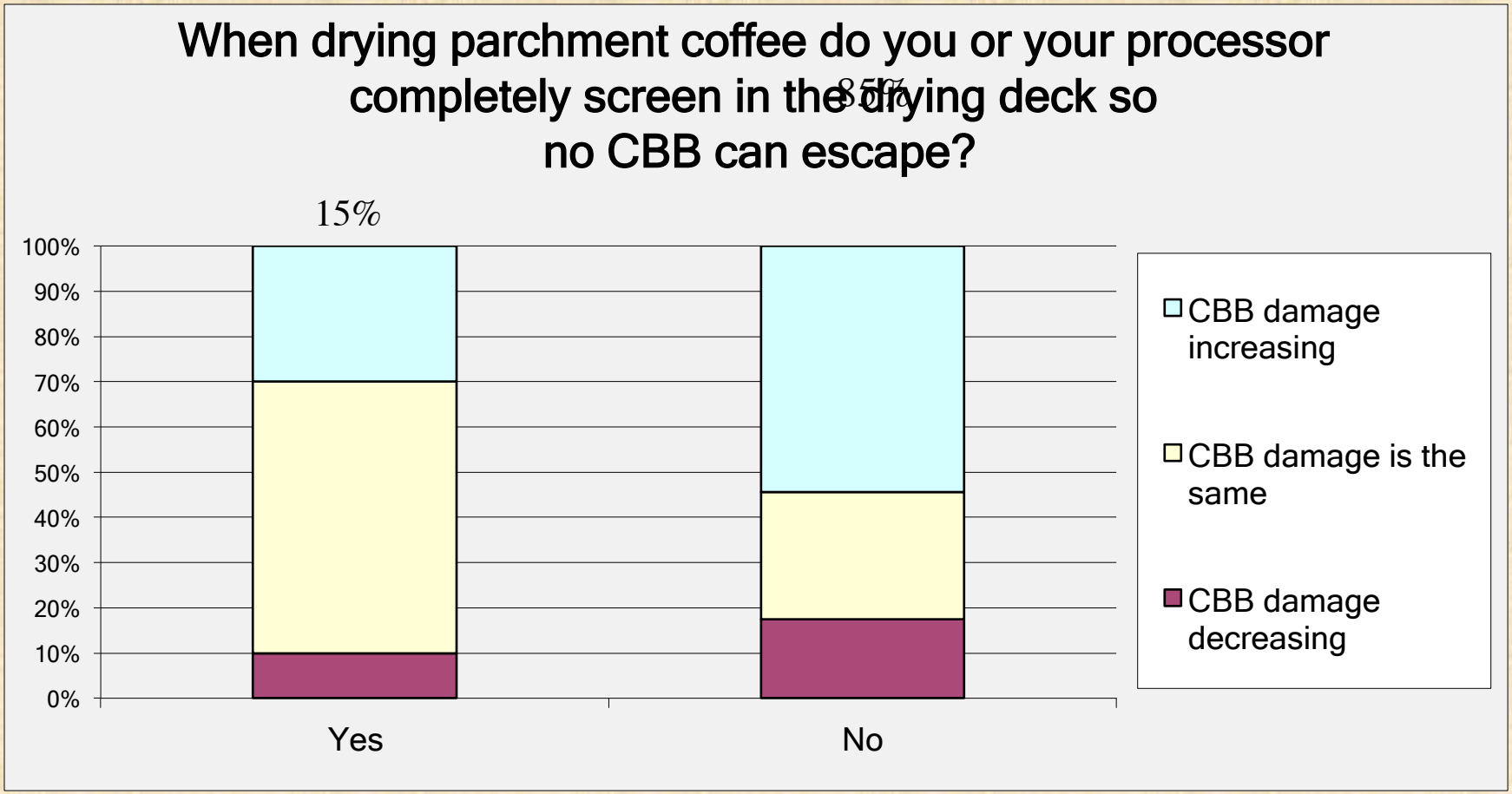
Most farms discard floating parchment; it may help reduce CBB damage.



Most wet mills are not screened, no impact of screening was perceived.

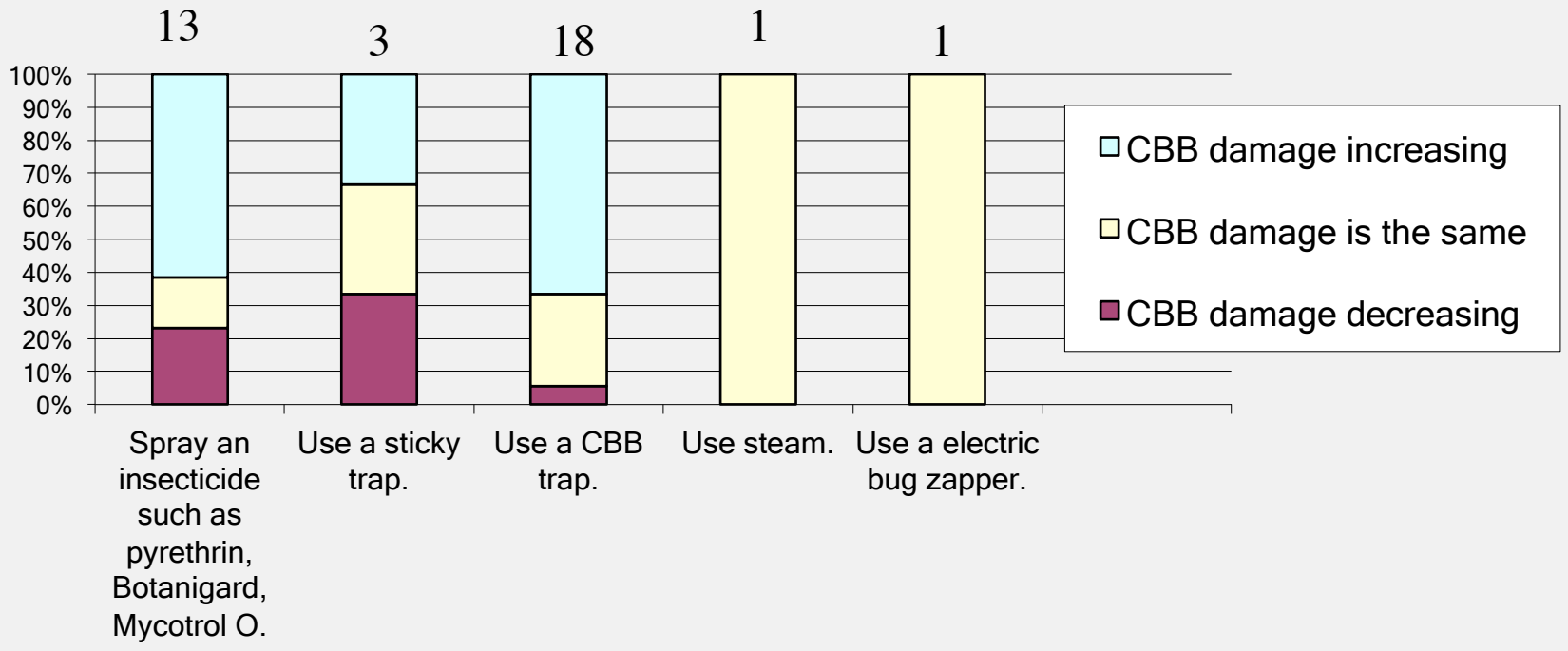


Handling of pulp waste, 60 % did some type of processing to kill CBB, 32 % dumped it as usual and only 9 % return it to the coffee orchard. Farms processing pulp waste to kill CBB perceived a higher reduction in CBB damage than dumping or return to orchard.

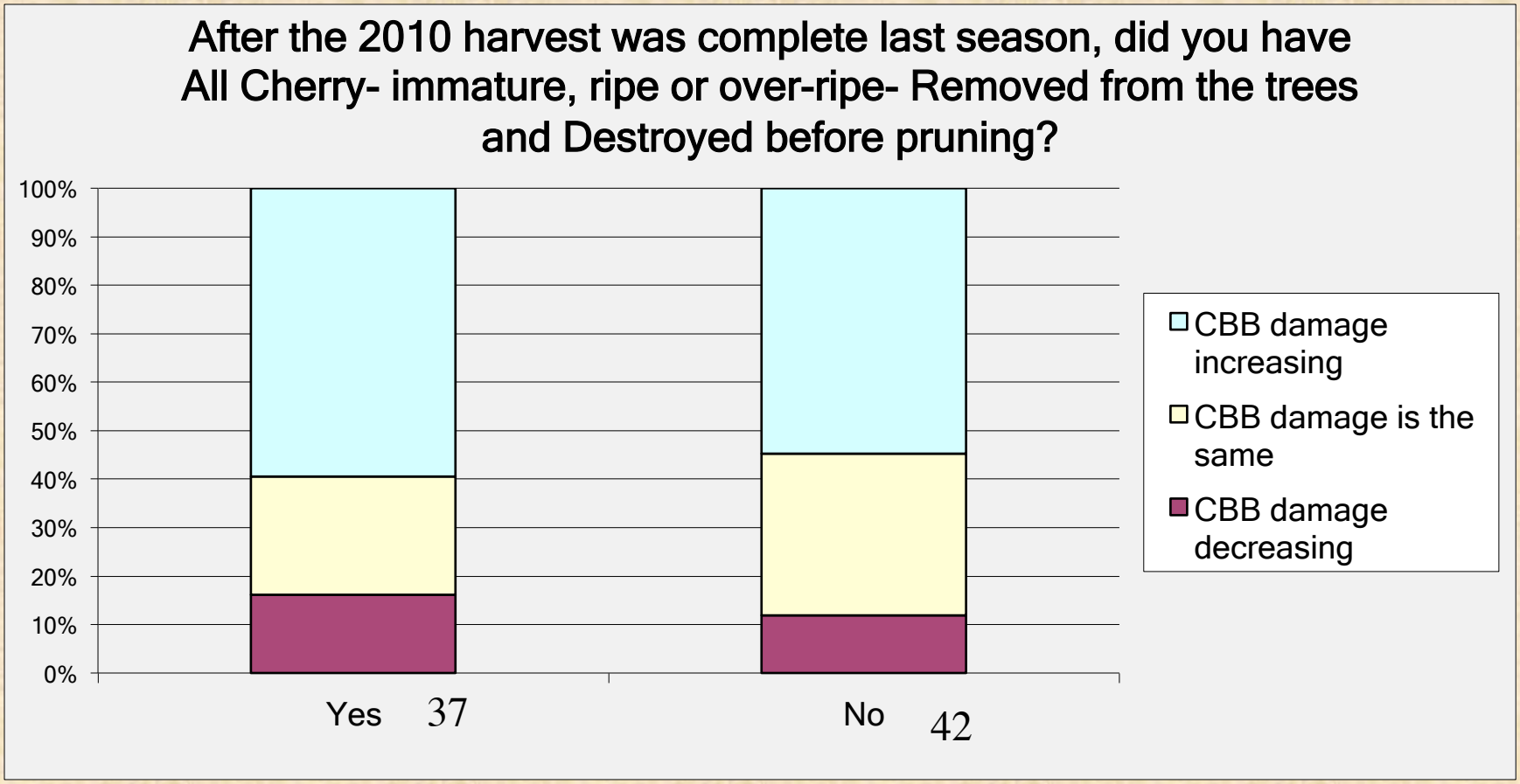


Only 15% of drying decks are screened to prevent CBB escape. Chart shows those with screened decks believed their damage was the same where the majority users of unscreened decks believed CBB damage was increasing. If CBB are seen emerging from sun-dried parchment then screening the sides of the drying and killing emerged CBB should be beneficial.

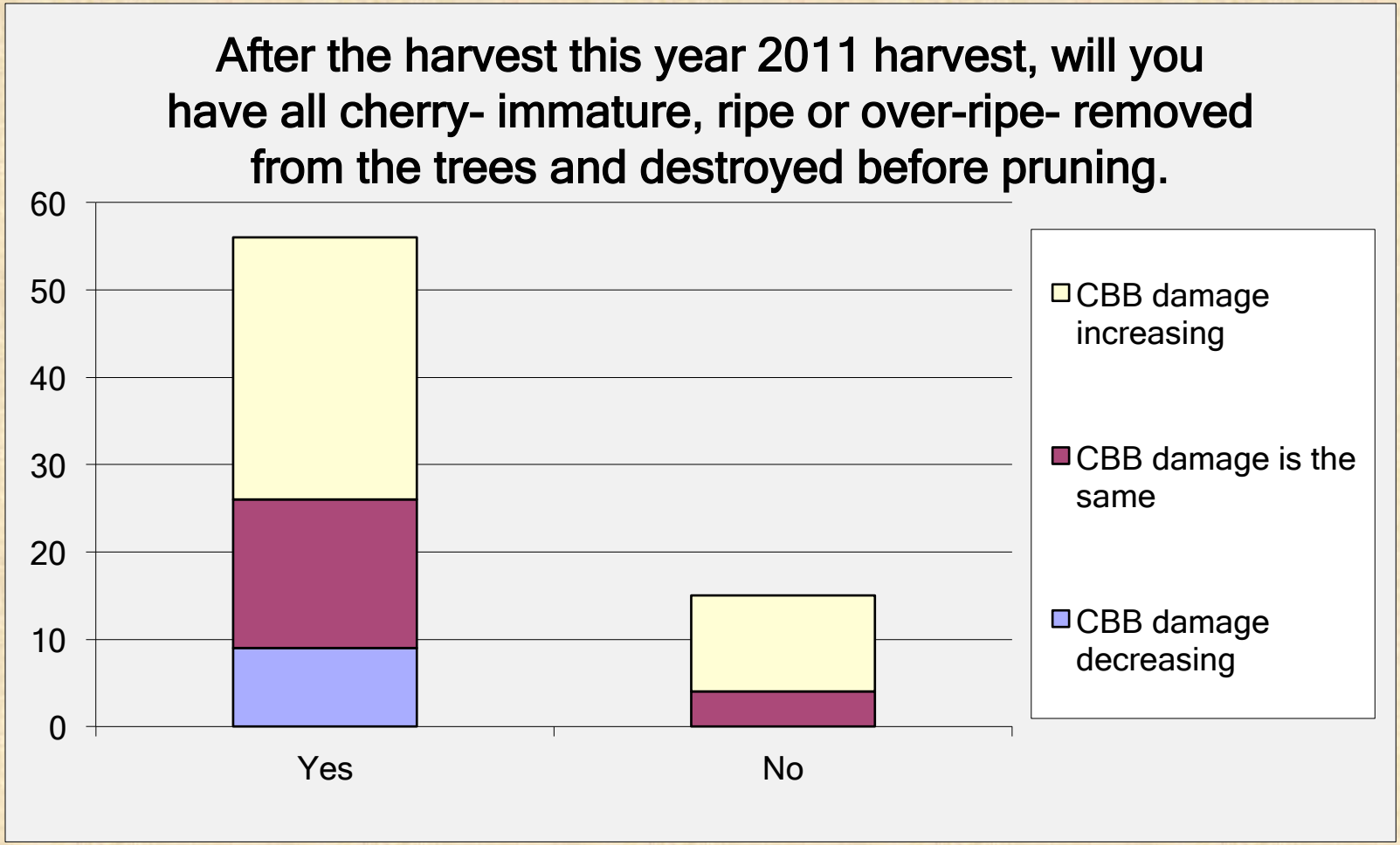
If you or your wet miller attempt to Contain and Kill the CBB in the pulping and drying areas, how are the CBB killed ?



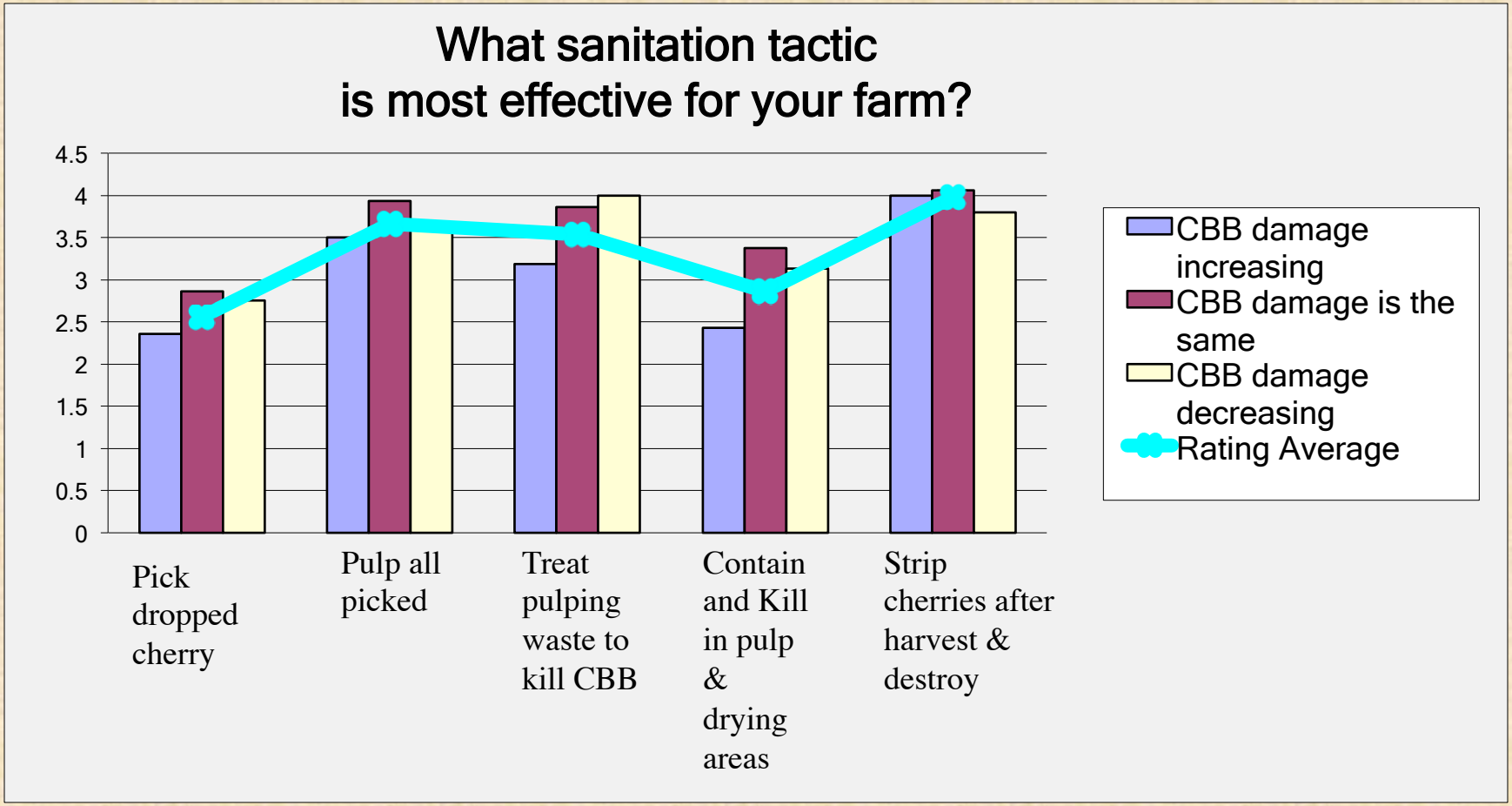
Only 36% of mills attempted to Contain and Kill CBB in the pulping and drying deck area. Half used a CBB trap. But growers that perceived a decline or the same amount of damage through the season sprayed an insecticide or used a sticky trap.



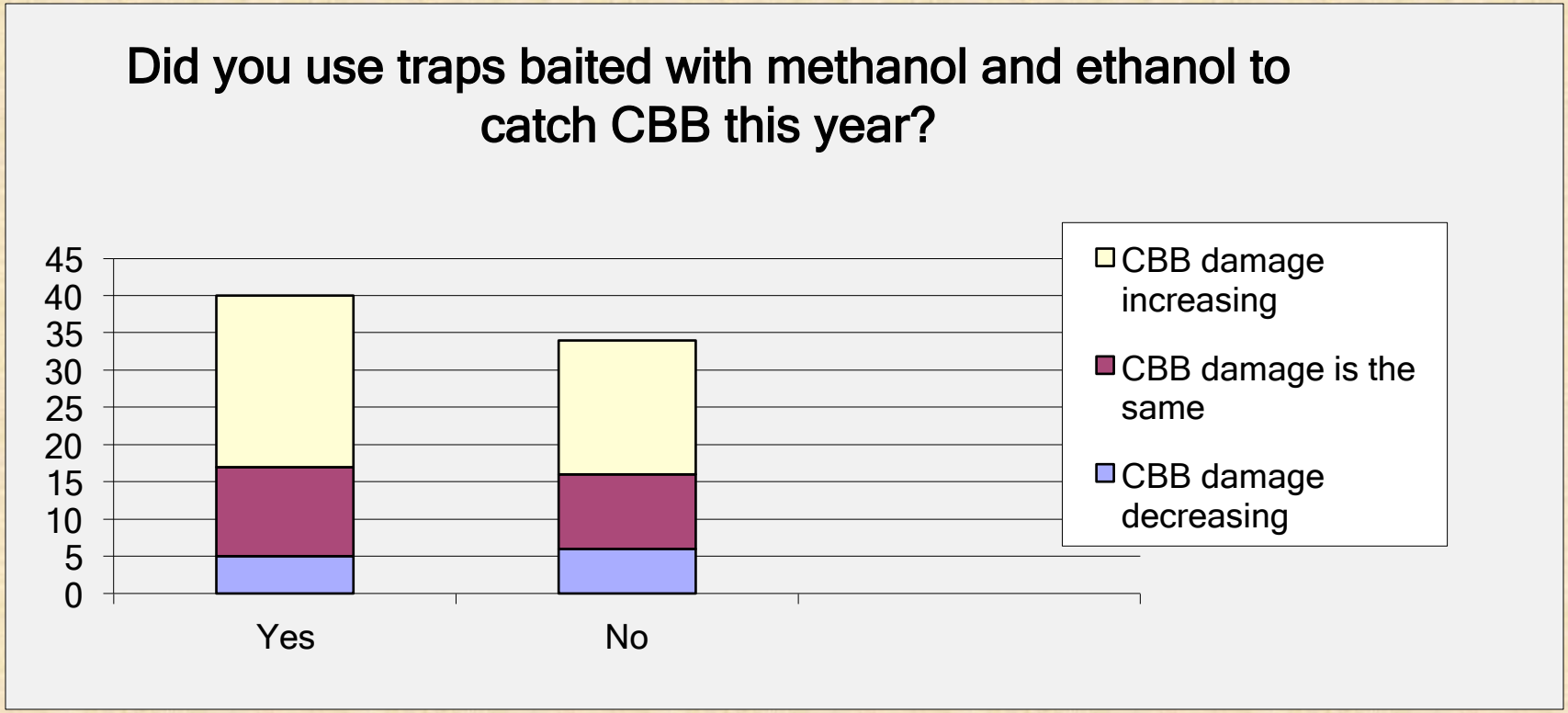
Less than half of farms said that after the 2010 harvest, all cherry- immature, ripe or over-ripe- were removed from the trees and destroyed before pruning. There is no apparent difference in the perceived CBB damage rates. Lack perceived differences may be due to too many dropped cherry during harvest prior to pruning.



Majority of farmers said they after the 2011 harvest is complete, all cherry- immature, ripe or over-ripe- will be removed from the trees and destroyed before pruning. This included all famers who perceived the CBB damage rate was decreasing on their farms.

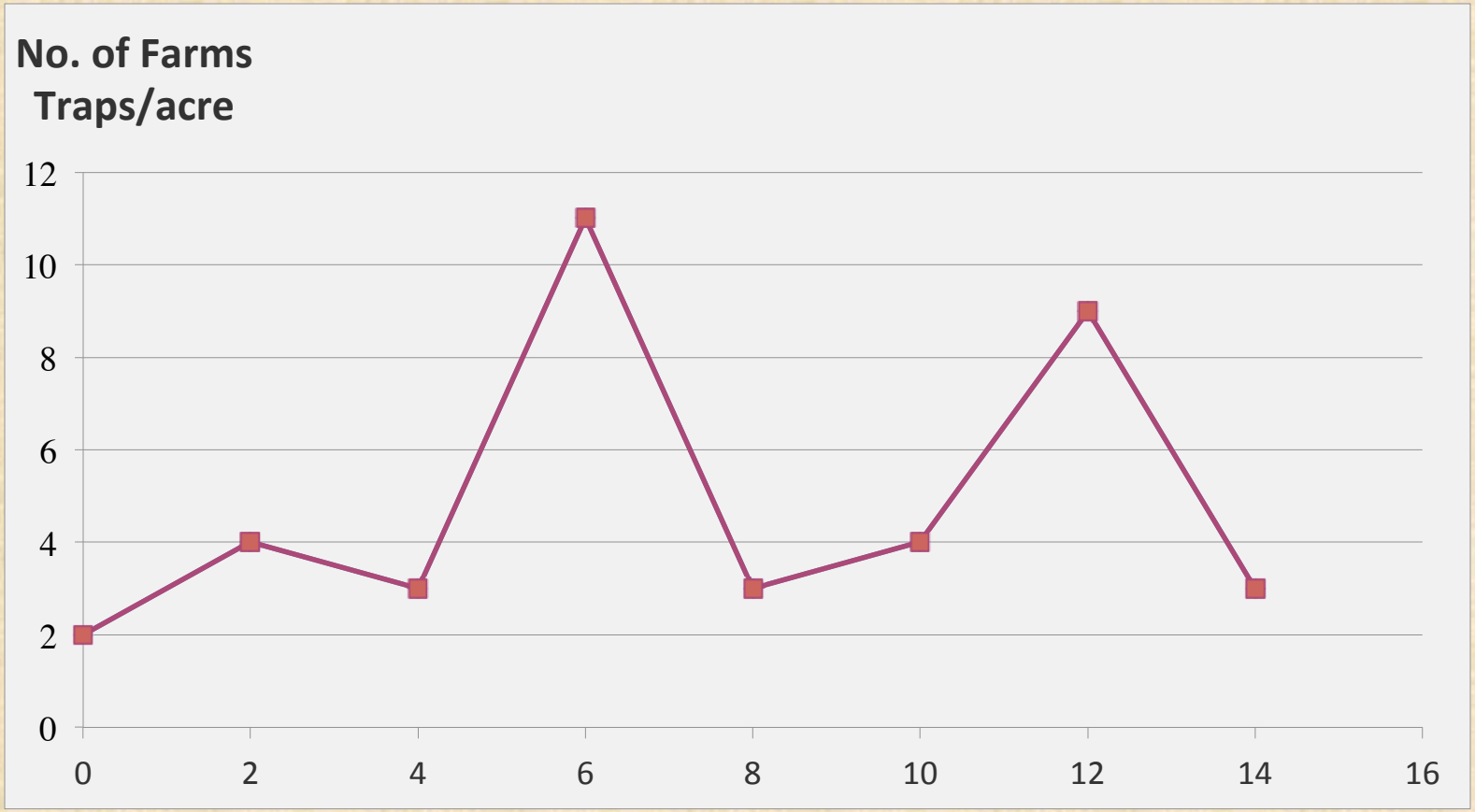


61 farmers rated the effectiveness of several sanitation practices. Stripping and destroying all cherries at end of harvest was rated highest. Farmers who perceived their CBB damage had declined rated 'Treat pulping waste to kill CBB' very effective.



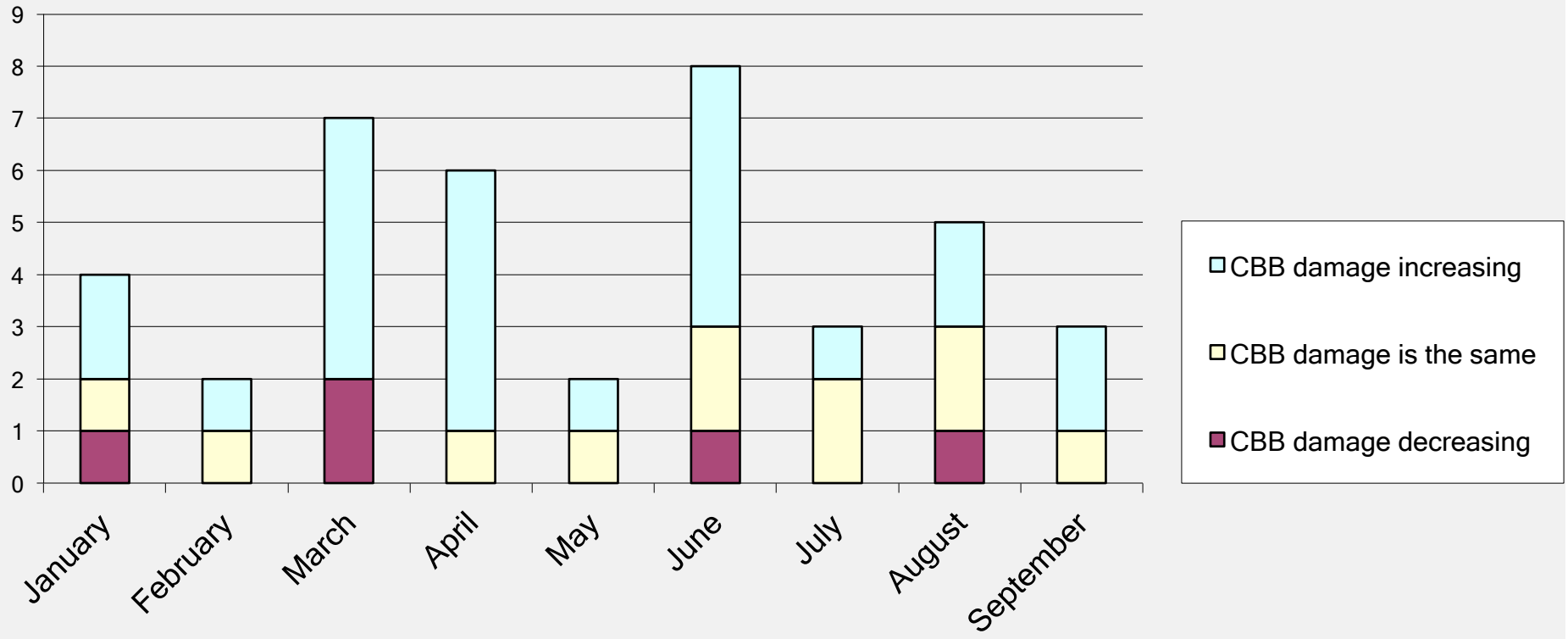
76 farmers responded about traps. Over 50% used traps. Most farmers used 3:1 solution- methanol to ethanol, few used the pouches. However use of traps did not impact the perceived rate of CBB damage over the season.

Trap density on farms

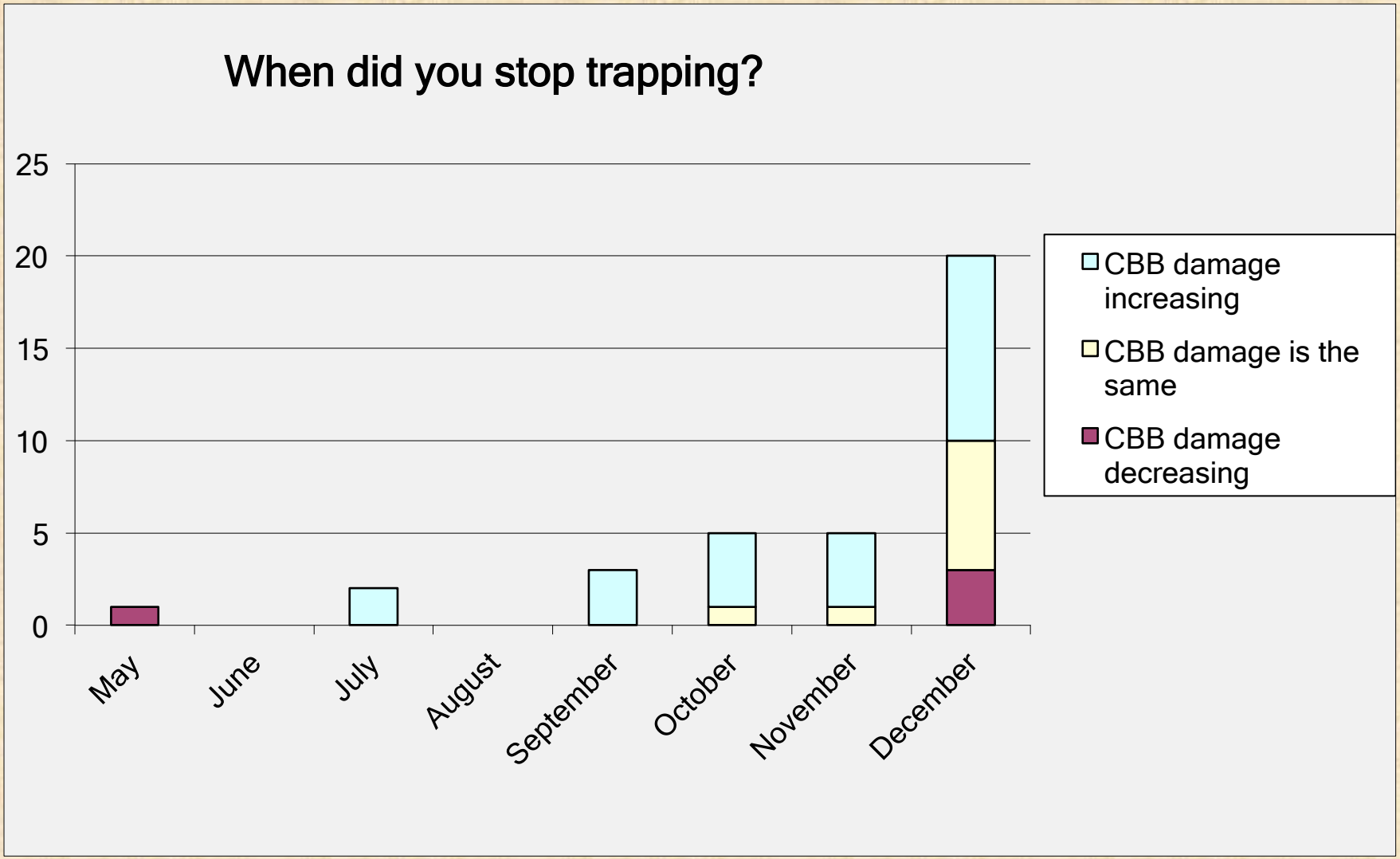


Majority put up 3-8 traps per acre, which was stated on the CTAHR website.
3 for monitoring. 8 for mass trapping.

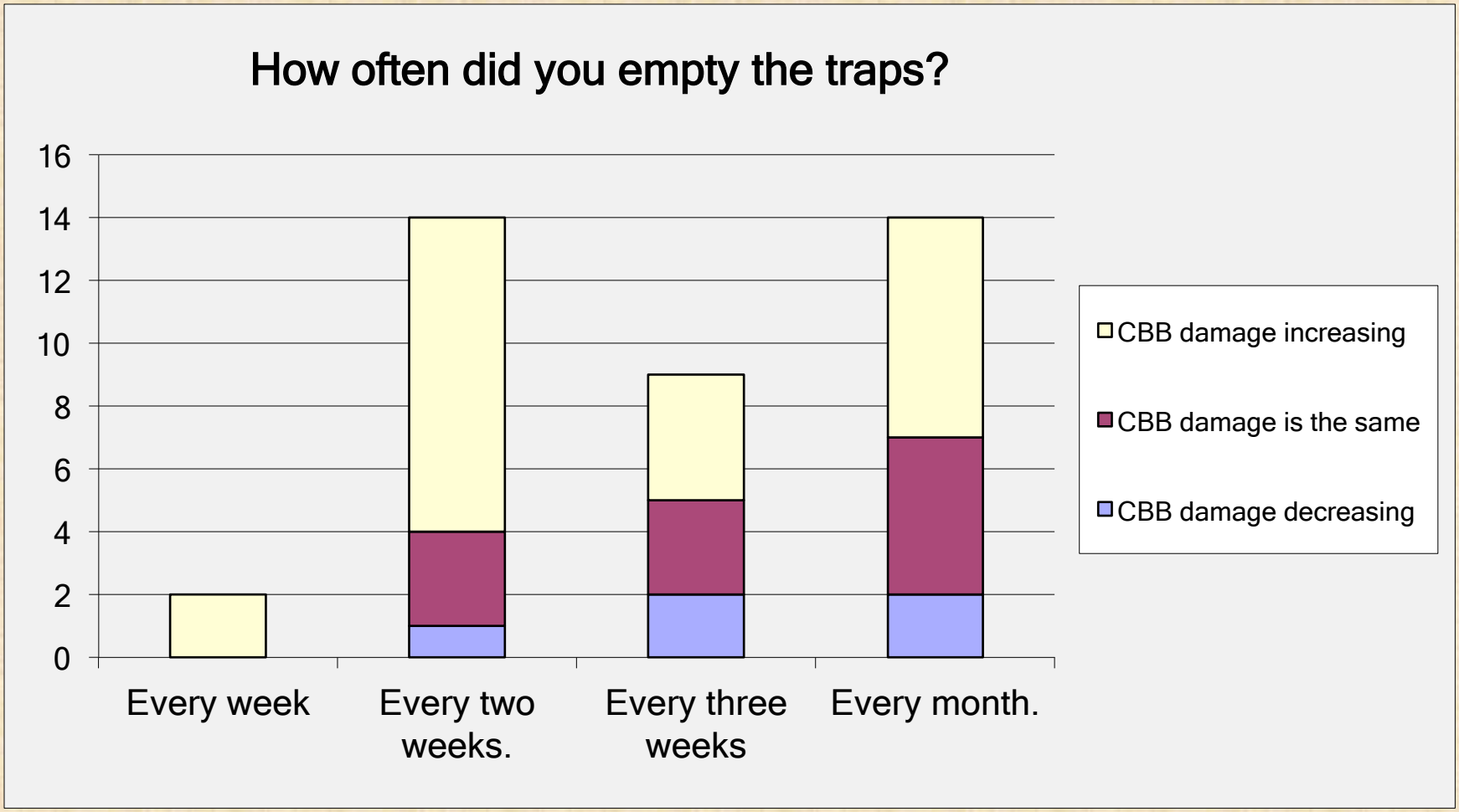
When did you start trapping this season?



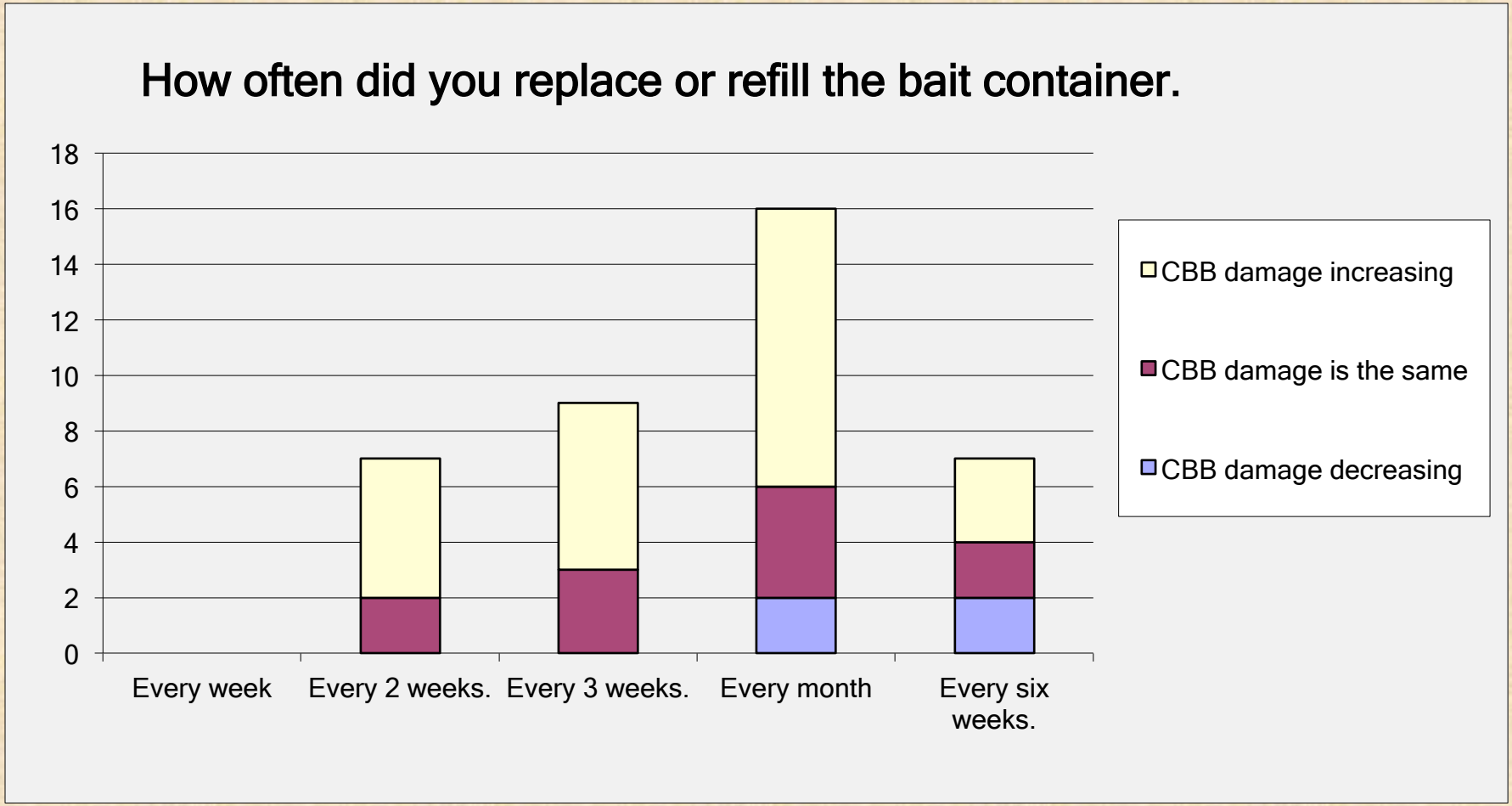
43 farmers began setting CBB traps from February to September. March, April and June were the most common months to begin trapping. We recommend start trapping after pruning. If your orchard borders farms or forest where coffee is not managed place traps outside your orchard so as not to attract CBB from outside.



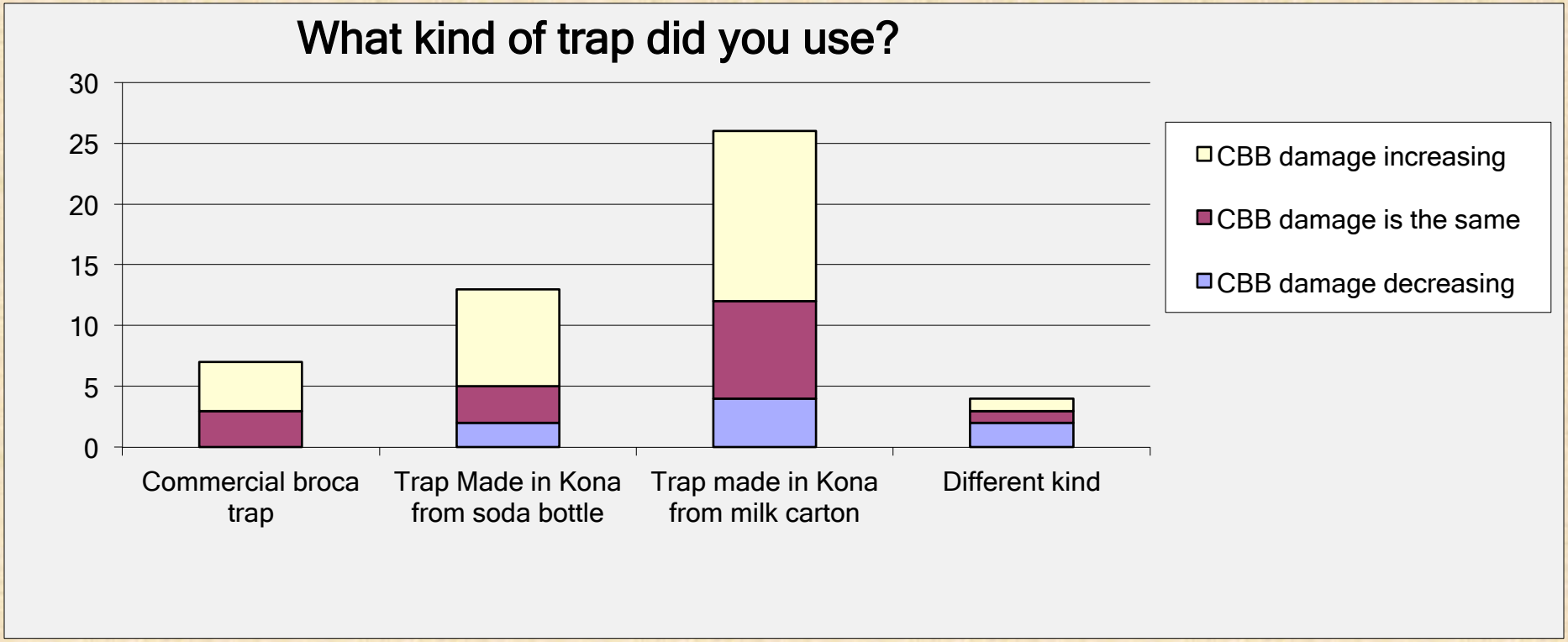
Most farmers did not stop trapping by December. Trapping may not be helpful after the cherries begin to mature as the cherries produce the same aroma.



Most farmers emptied CBB traps every 2 to 4 weeks.

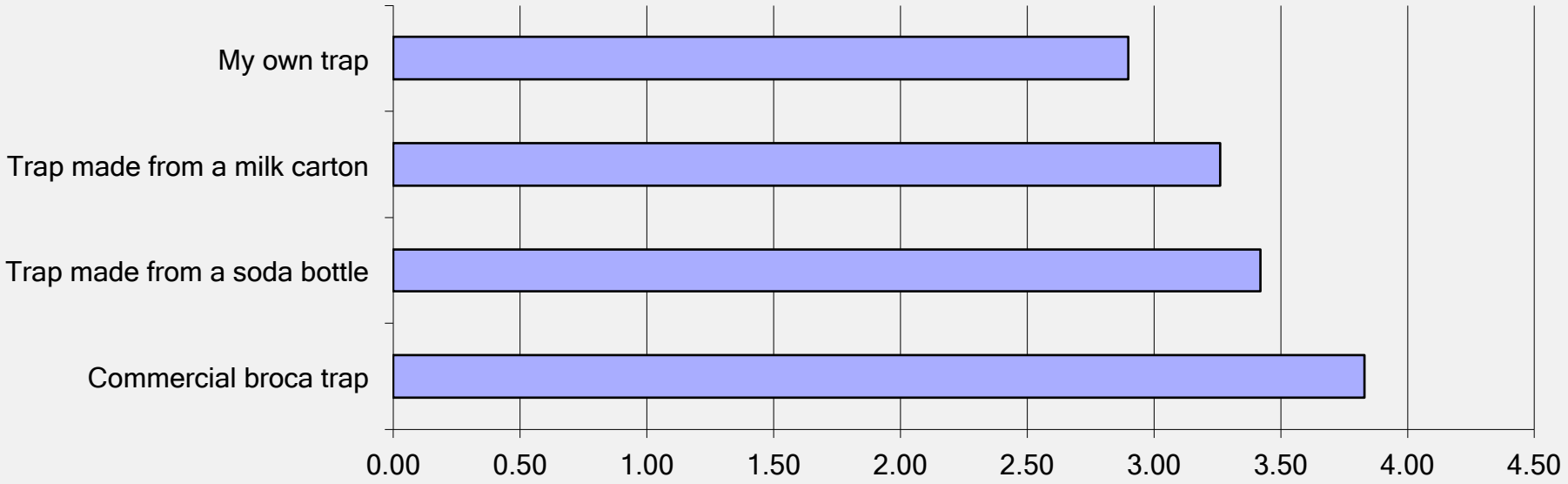


Traps were rebaited every 2 to 6 weeks; once a month was most common.



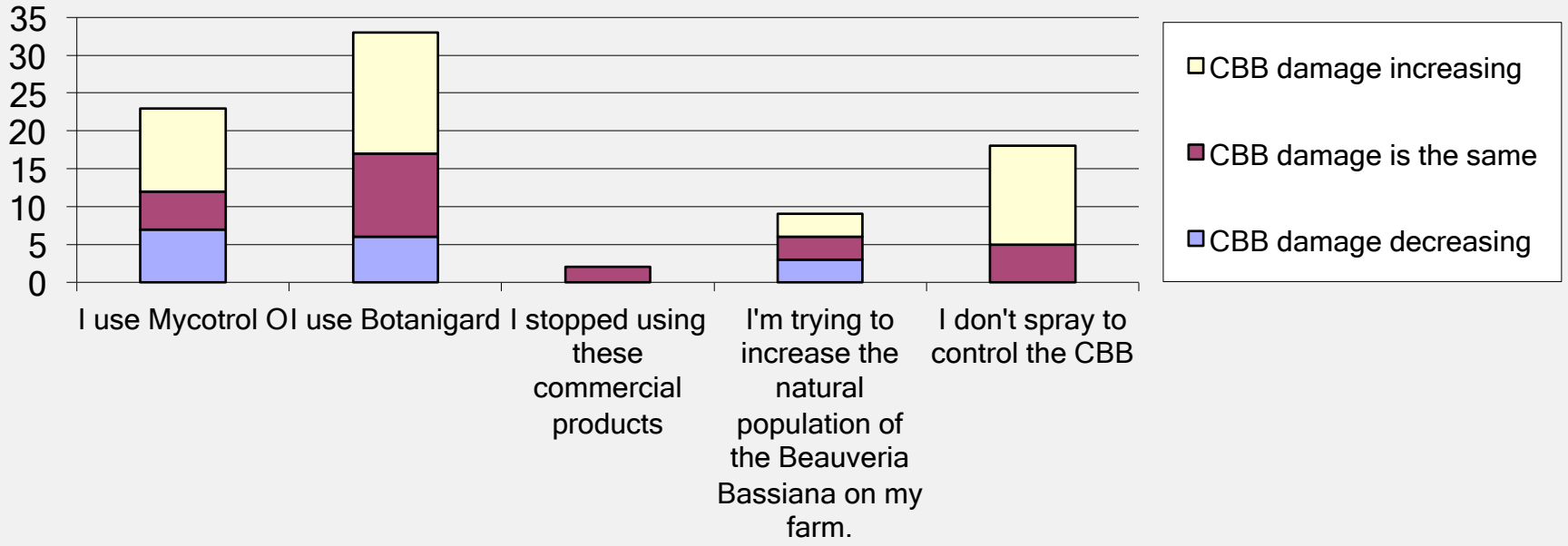
Most farmers used traps made in Kona from milk cartons.

Can you rank the effectiveness of trapping?

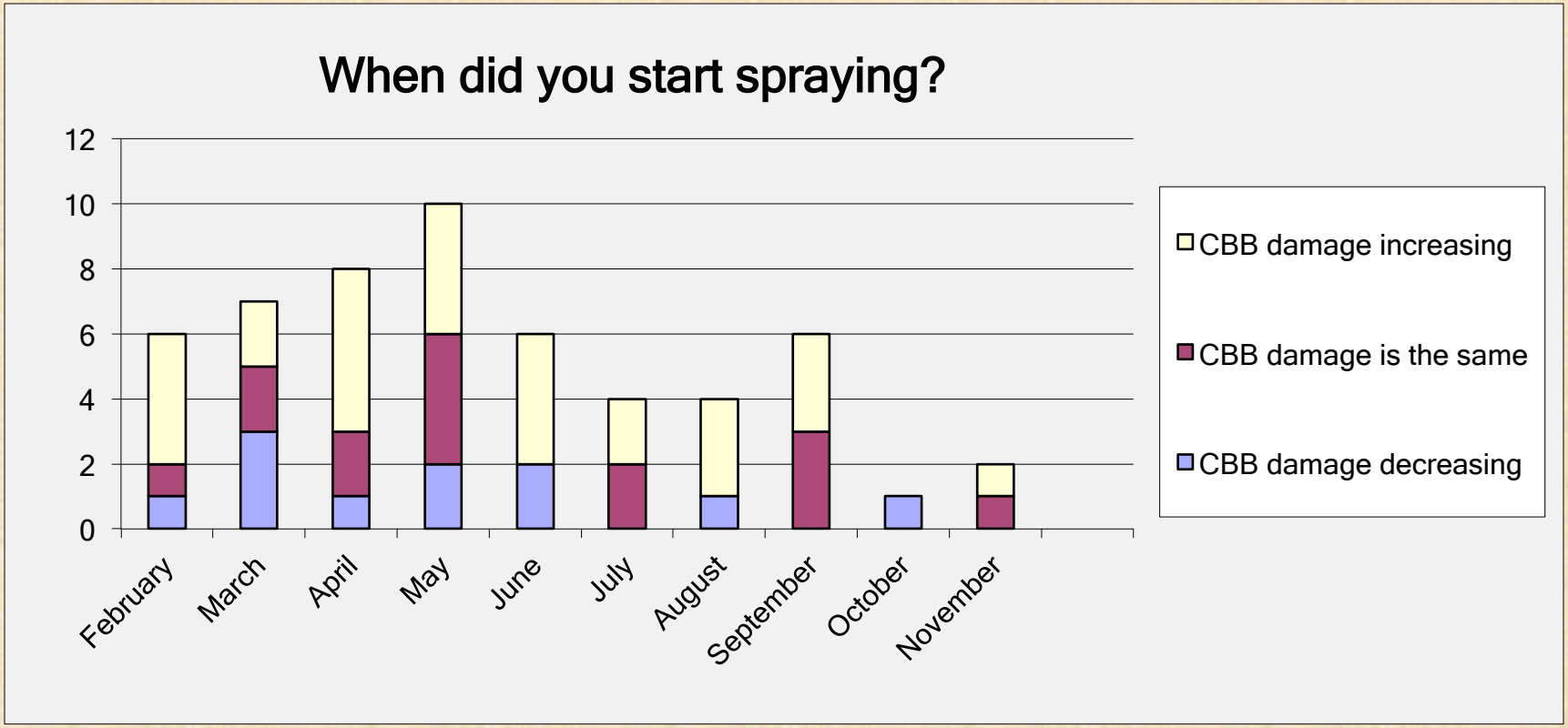


However, the commercial broca trap was rated as more effective.

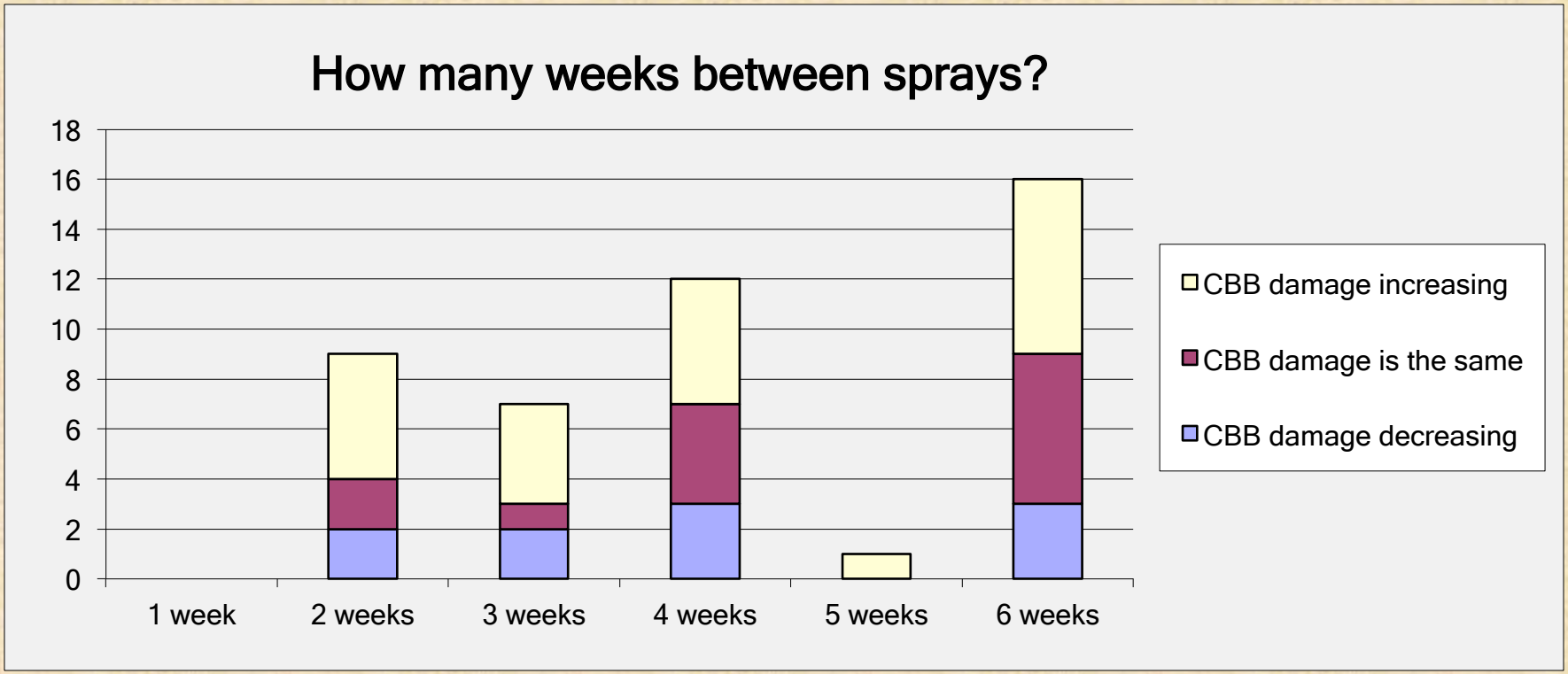
Are you spraying these commercial insecticides containing spores of the fungus Beauveria bassiana?



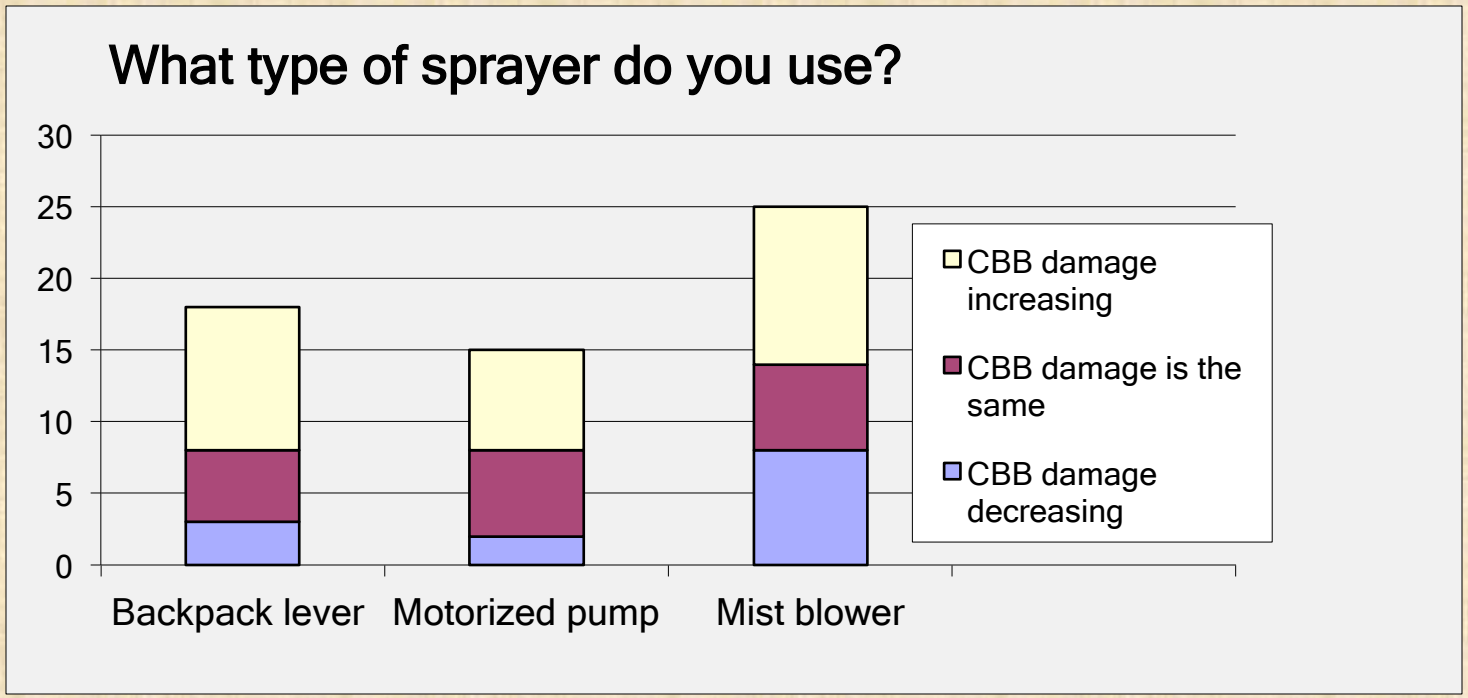
73 farmers responded, 75% spray the commercial BB insecticide.
Most farmers sprayed 1 qt/ acre of commercial BB.



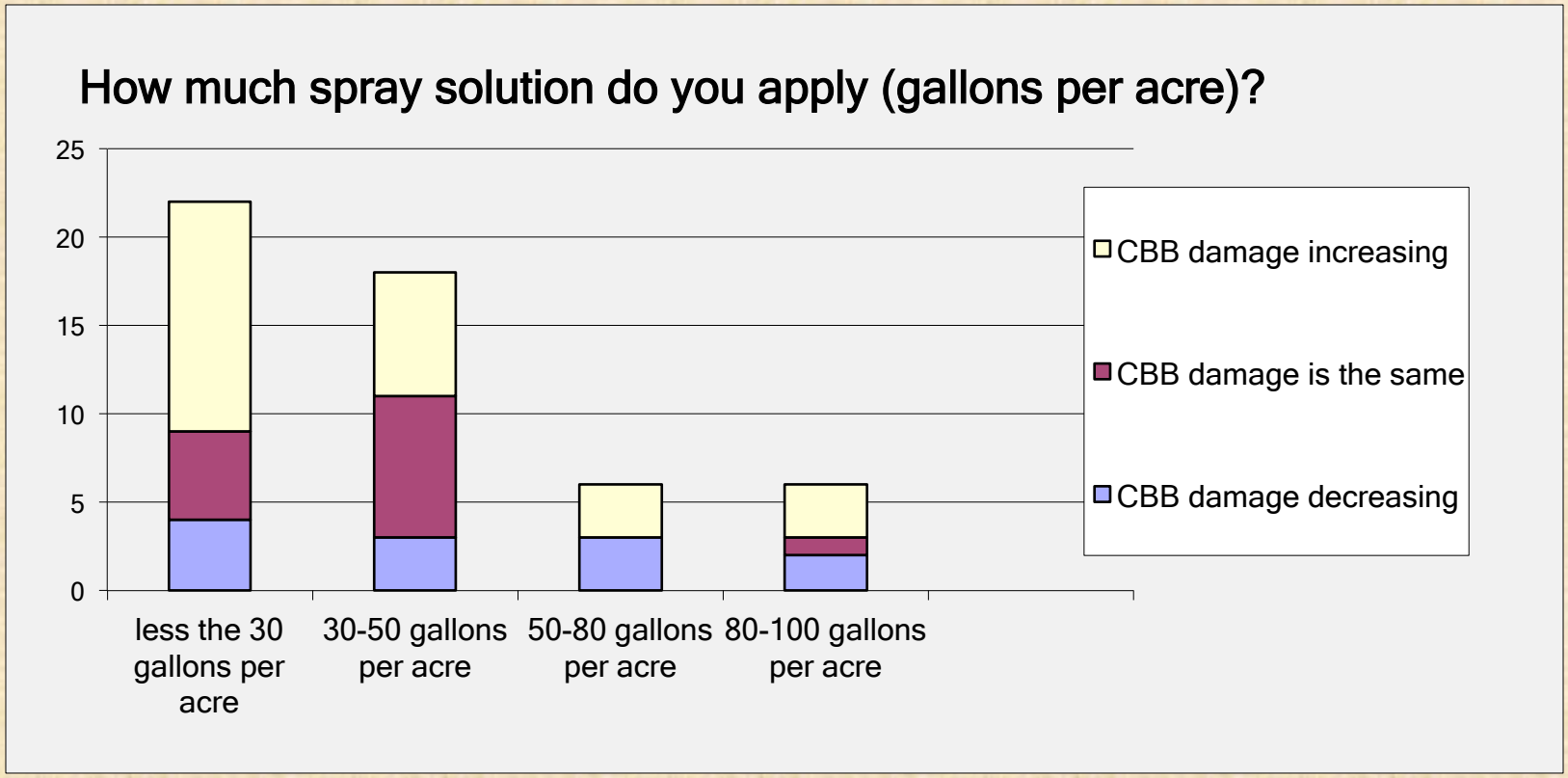
Most farmers that spray began in March, April or May when the cherry were developing.



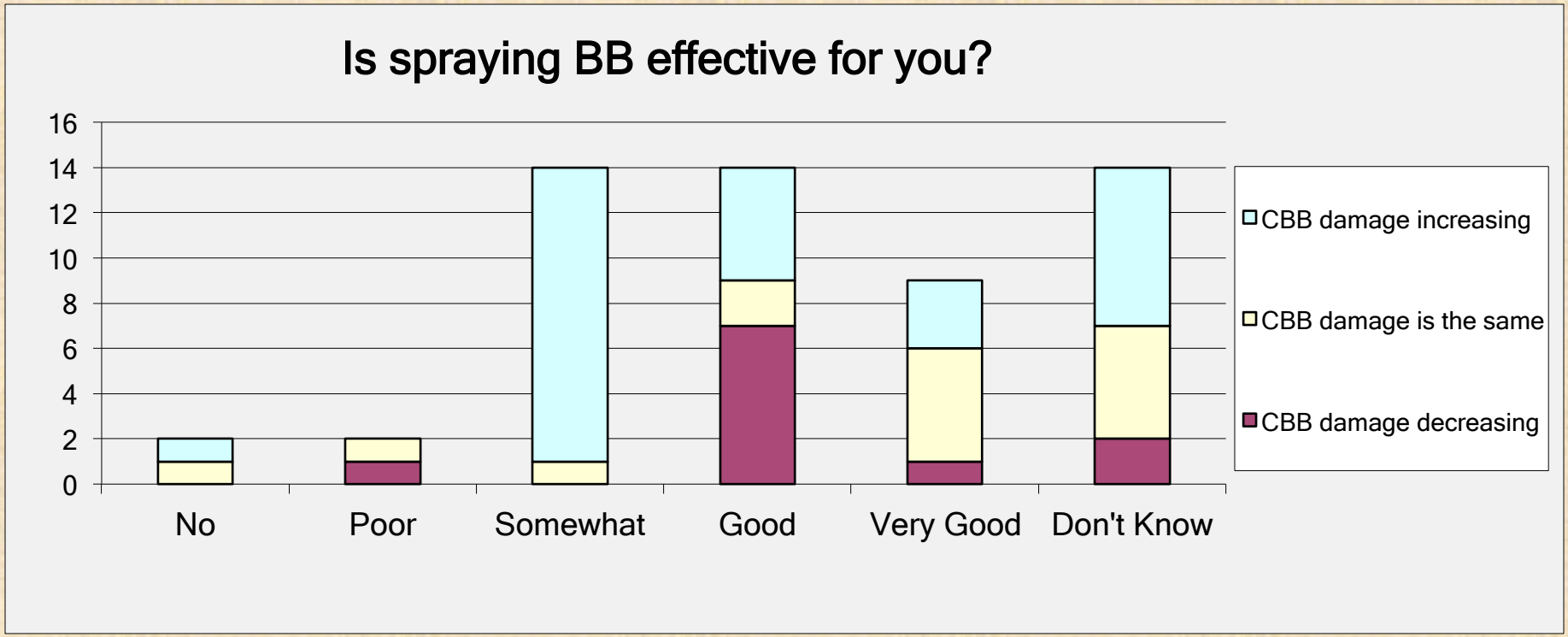
Spraying every 4 to 6 weeks was most common.
It will be more cost effective if spraying occurs when CBB is observed flying or trap catch indicates lots of CBB being caught.



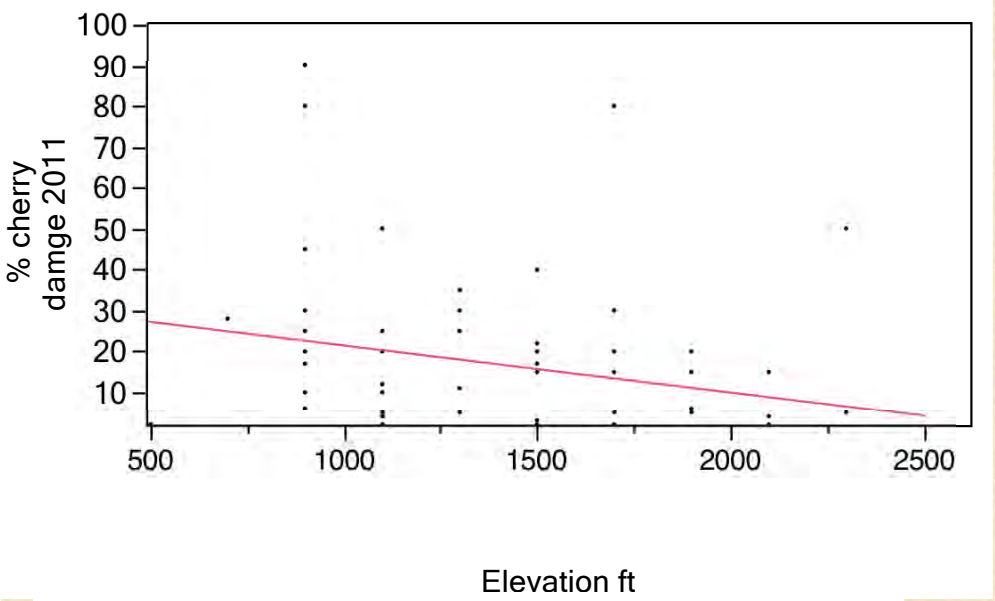
Fifty six commented on types of sprayers used for BB sprays. Most (46%) used mist-blowers, 34% used backpack and 29 % motorized pump. A third of Mist blower users reported decreasing CBB damage compared to only 16 % for backpack users.

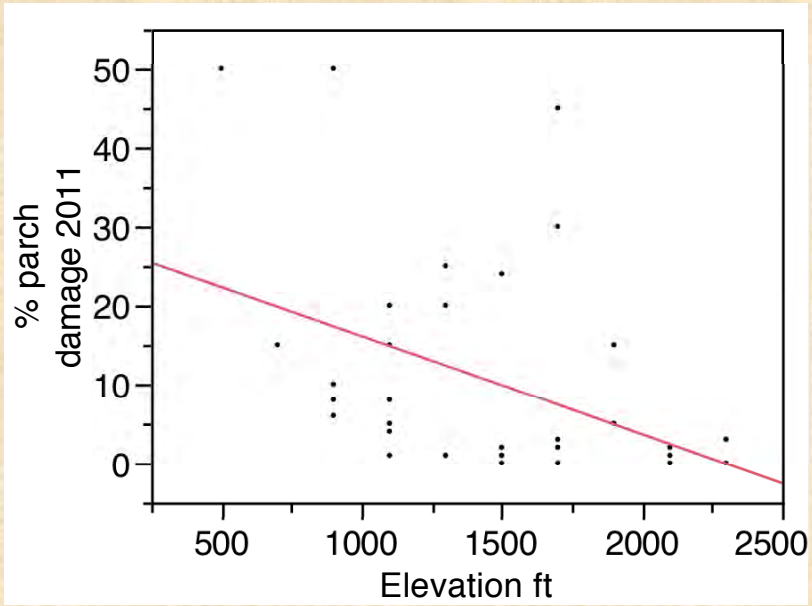


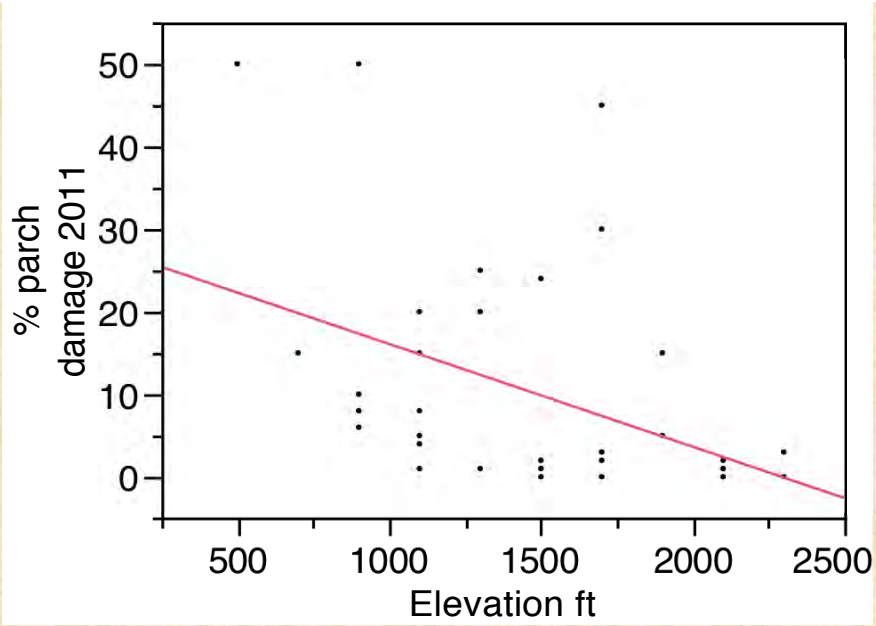
Gallons of spray per acre related to type of sprayer. Larger sprayers dispatched a greater amount of solution or applicators were more generous with their application of spray solution.



30% of 60 farmers did not know if spraying was effective. 40% felt spraying was good or very good. Those who thought CBB damage was decreasing were likely to rate the effectiveness of spraying as good. Very few farmers tried, Provado, Admire, and Javelin (Bt) insecticides.



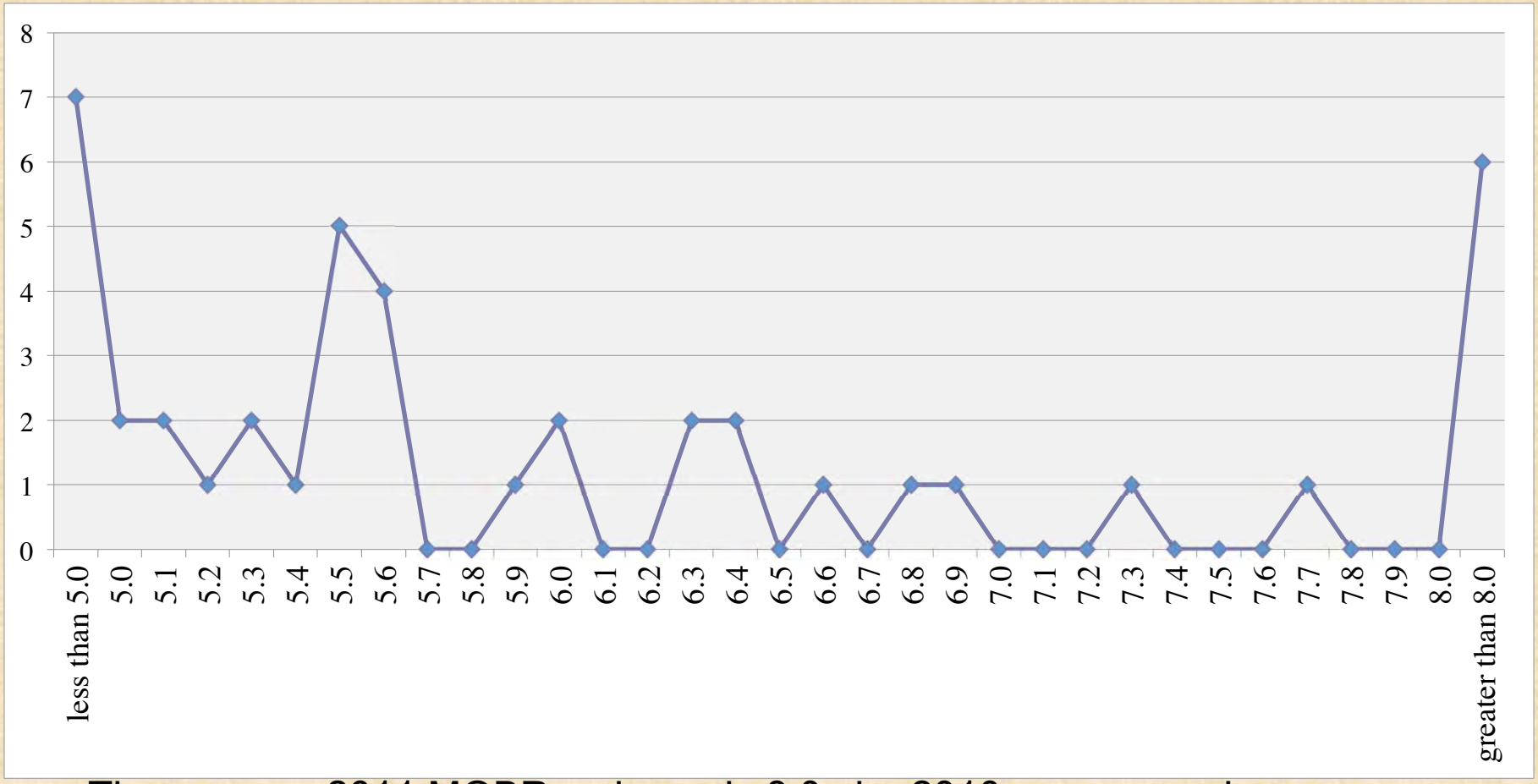




Trend

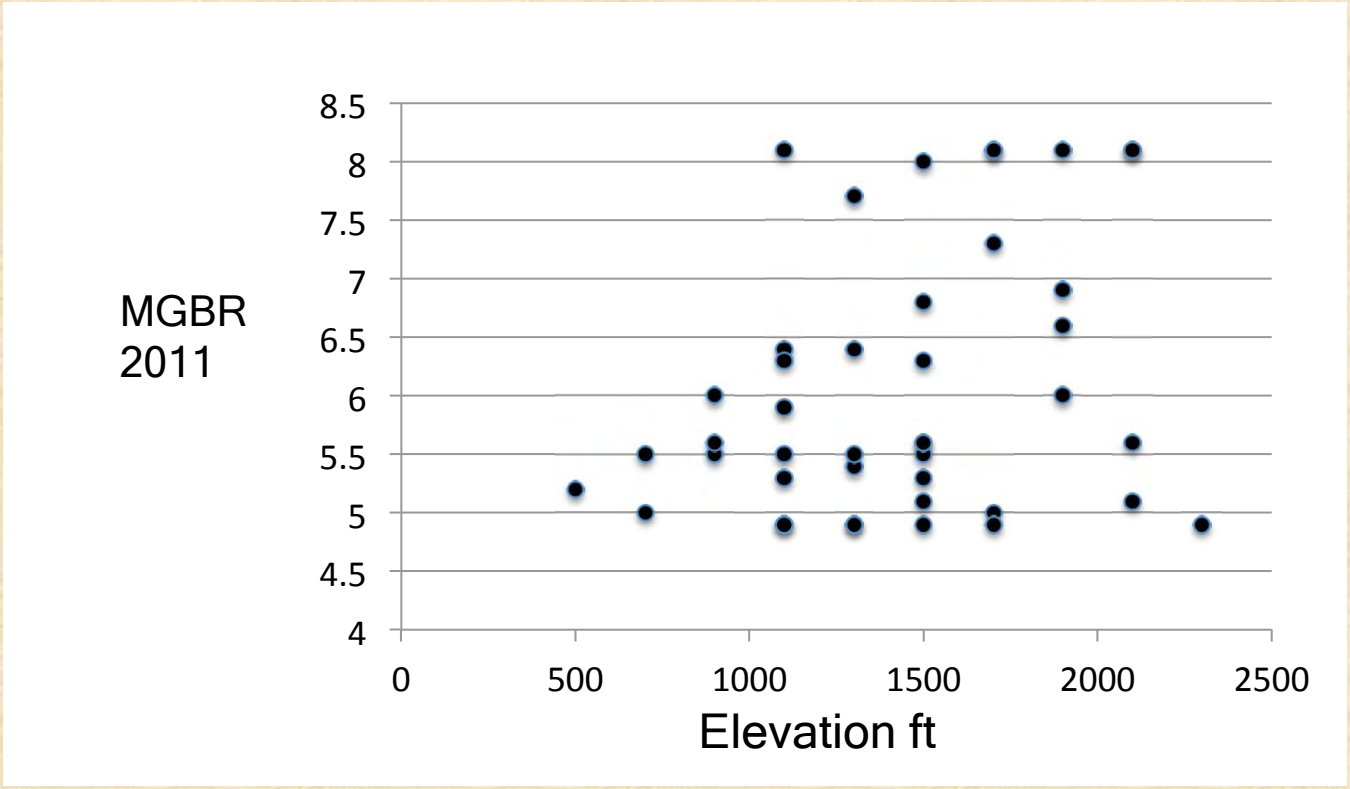
Cherry, parchment and green bean damage decreased as elevation increased in 2011

Farmers estimates of Marketable Green Bean recovery ratio for 2011



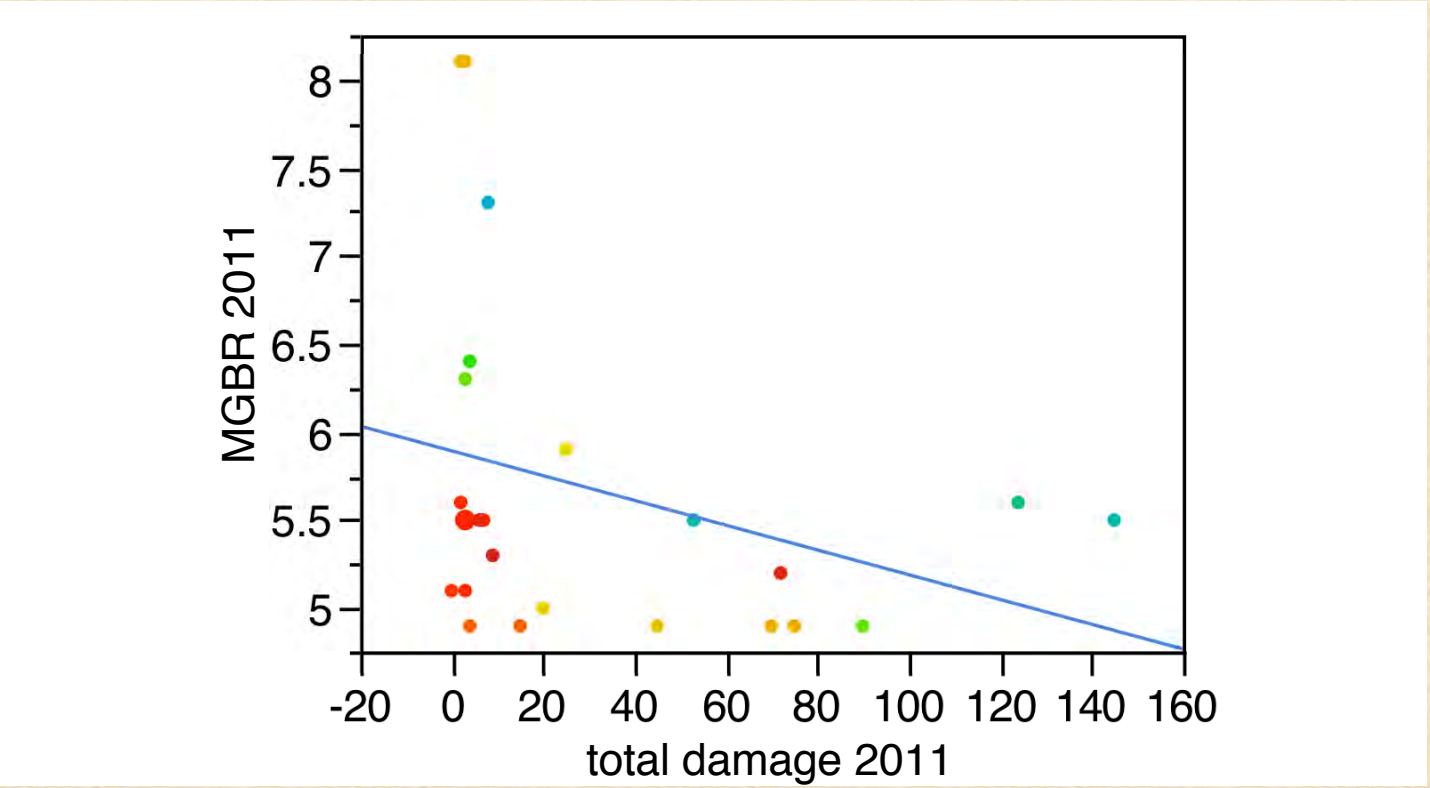
The average 2011 MGBR estimate is 6.0, the 2010 average estimate was 5.7, and normal (before CBB) average was 5.3.

However, there is no clear relationship between elevation and Marketable Green Bean Ratio -MGBR



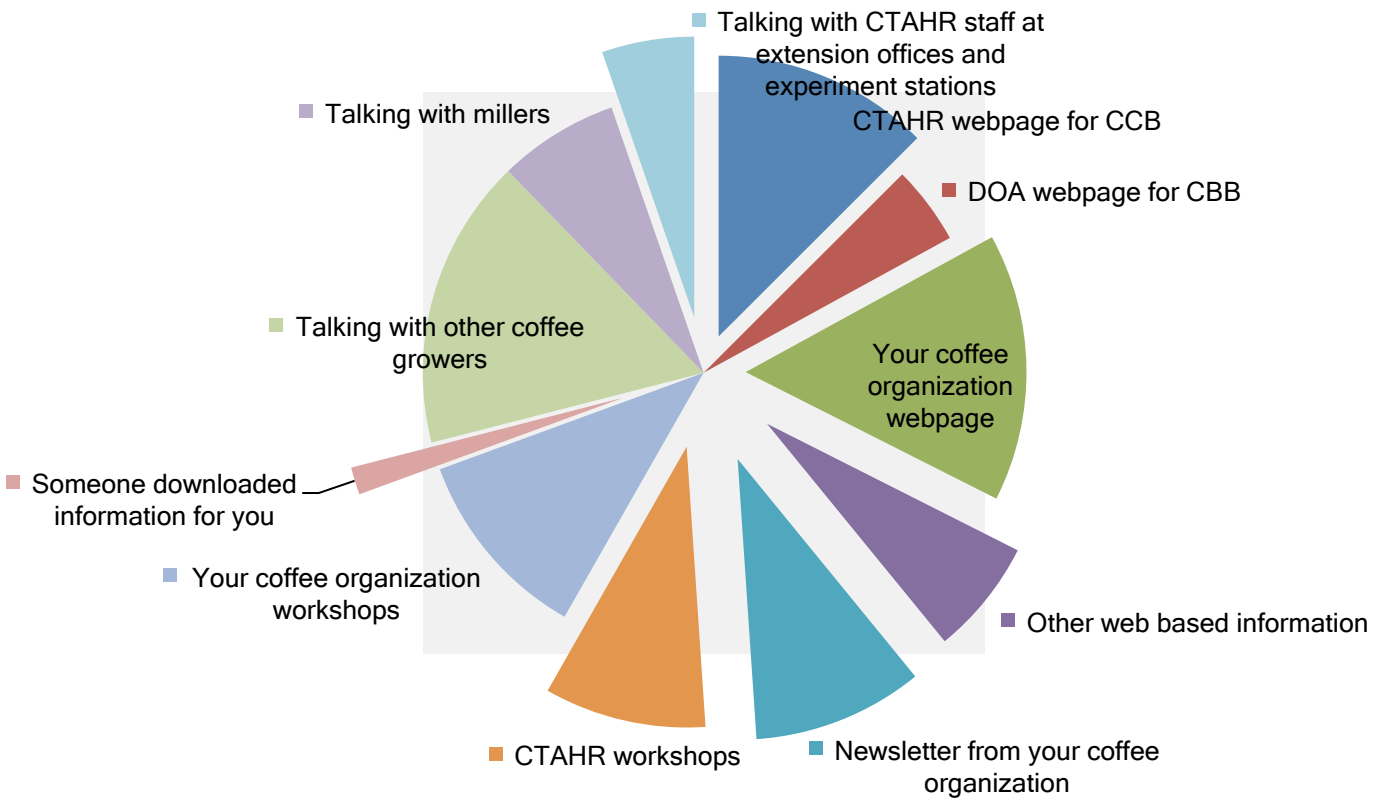
MGBR can calculated easily but can not be calculated until milling and grading is complete for a given harvest round or end of season. Asking and collecting MGBR provides information about costs of producing green and provides an idea of where prices should be set. Quality and amount of MGBR information is best gathered in the annual DOA coffee production survey.

No clear relationship is seen between reported % damage of cherry, parchment, green bean or total damage of these and MGBR.



We expected MGBR to increase with increasing damage and it did not. This may be due to estimates provided.

Where do you get information to control CCB?



Preliminary Conclusions : 1st State-wide CBB Survey of Damage and Farmer Practices by the UH/ CTAHR Coffee Extension program.

- CBB is infesting coffee throughout Kona and at all elevations.
- CBB is causing losses of marketable green bean and costing farmers time and money to control.
- Knowledge and implementation of CBB control strategies is occurring.
- Implementing the tactics of the sanitation strategy is occurring. These tactics are challenging due to a high labor requirement. Yet these tactics are the source of success in other coffee regions with CBB.
- Accuracy of damage reported is questionable; it will improve as the 2011 crop is milled, and millers and farmers are surveyed.
- This survey will stimulate discussions and research, and technology will be developed for Hawaii's coffee industry war on CBB.

How can you help?

- Avoid visiting a non-CBB farm after visiting a farm with CBB
- Change your clothes
- Brush off and inspect your shoes, clothing, equipment, etc. – CBB are hitchhikers
- Report possible or new CBB occurrences to the UH Cooperative Extension Service or Hawaii Department of Agriculture
- Remove unmanaged or wild coffee trees on your property
- Perform sanitation practices on your farm or backyard
- Do not transport unroasted coffee, coffee plants, or seeds to non-infested areas. Call HDOA for quarantine information.

Remove all cherry from the tree and then prune

Let's work together for the coffee industry

Thank you.

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