Coffee Berry Borer overview of status & impact

Coffee Berry Borer – CBB

the problem

- It spends most of its life hidden inside the berry
- Natural enemies also find it hard to find – only a small guild of specialist parasites and predators
- Makes it difficult to spray – a small window of opportunity
- Farmers can’t see it easily either – so they don’t notice it building up
- Especially difficult to control at low altitudes and when there are several flowerings/year

Coffee Berry Borer – CBB

control methods - cultural

- Hand picking is still the most recommended method
- At some times of the year, most of the CBB population is in fallen berries which are especially difficult to find and remove
- CBB cultural control is very laborious, and difficult to monitor and evaluate the process as well
- With increasing labour costs and global competition (increasing mechanization) hand picking is not a sustainable solution

Coffee Berry Borer – CBB

control methods - chemical

- Sometimes effective, but has many downsides
- It’s toxic, endosulfan is generally regarded as the most effective, but it’s also the most dangerous
- Now banned in many countries
- It’s expensive – can take five days to spray one hectare on a mountainside
- It’s just not sustainable in the long term with consumer concern and high labour costs

Coffee Berry Borer – CBB

control methods - biological

- Several alternatives, none to date are effective
- There are four principal wasp species, we have tried three of them but the control they exert is not enough
- A main problem is that the wasps also live in coffee berries which are harvested every year
- Wasp populations are much higher in abandoned coffee, so this does help to keep CBB inoculum down in this case
**Coffee berry borer – CBB control methods - biological**

- Fungal sprays, especially Beauveria bassiana (Bb) has also been tried, but also with limited success
- Mortality is not as high as an insecticide, so this doesn’t enthuse farmers, since spraying costs are equally as high
- And quality control of commercial Bb products is difficult and costly especially in remote areas
- There are many other agents, including ants, birds, nematodes – but to date none have been convincingly shown to cause significant mortality

**Coffee berry borer – CBB control methods - trapping**

- A number of traps have been developed initially in Brazil and most recently by CIRAD, these are based on a mix of methanol + ethanol, and some with added terpines
- Good trapping rates have been reported in some cases, but others have not found them effective
- Trapping is not a panacea, it could be effective when combined with other methods
- If regularly inspected they do help to warn of when CBB are emerging from their brood-berries

**Coffee berry borer – CBB control methods – Integrated Pest Management**

- The idea is that through some combination of the previous (albeit inefficient) methods we arrive at a combination that is optimal = IPM
- The point is to attack CBB at critical points in its life-cycle with the most effective at that moment
- The problem is that this takes a lot more knowledge and effort by the farmer to sample, calculate and intervene

**Coffee berry borer – CBB control methods – IPM**

- All this makes it very difficult for small farmers with scarce resources to dedicate regular IPM monitoring and intervention when for months at a time it may yield no visible pay-off
- It can be especially galling when the assiduous farmer sees his neighbours not bothering and then gets an influx of CBB at a later date.
- All this militates against full & effective IPM and what actually gets carried out is a combination of two or three techniques but often in a fairly ad hoc manner

**Coffee berry borer – CBB control methods - others**

- The best solution would be a resistant variety
- Some indications of resistance from work in Colombia
- Difficult to imagine a completely resistant tree without a GM approach
- GM work in Brazil includes delayed ripening that would help to control CBB
- No specific GM CBB plant exists at present (?)
Above all perhaps, it’s a labour problem

- Currently all methods require a lot of labour
- To control CBB well requires concerted action and attention to detail
- Such labour is in short supply
- We need a new approach

Another IPM project isn’t going to solve it

- So try turning the problem upside down …
- Try thinking of CBB as a sort of ally, it's trying to tell you something …
- If your coffee is really suffering from infestations – and you’re finding it very hard to control …
- It’s telling you that you are probably going to be out of coffee in 10 to 20 years
- So start thinking of radical solutions
- And areas where it’s now not much of a problem – that’s going to change too

Suitability for coffee production for 10 coffee-growing municipalities of Nicaragua

Peter Läderach, Andy Jarvis, Julian Ramirez
CIAT [for GTZ CafeDirect AdaptCC project]

Mexico – Reuter’s report 3rd March 2009

- Ingrid Hoffman, (a coffee farmer in Tapachula, Chiapas) :
  “The land is very tired, it has faced hurricanes, winds, natural deterioration. Everyone here has a smaller harvest, less maintenance, less investment”
- “We sell all over Europe and the United states so obviously the exchange rate will help,” said Hoffman, whose series of plantations are producing 75 percent less coffee than they did 20 years ago.
- “I think one day we will be able to recover,” she said.

Afecta cambio climático las cosechas de café Fecha: 24 de febrero del 2009

Reportero: Redacción Once Noticias

- “Muy pronto el café podrá consumirse sólo por temporadas. Según los cafetaleros de San Pedro Cafetitlán, Oaxaca, cada vez es más complicado tener buenas cosechas de café.
- “Ya la producción de nuestros cafetales bajó bastante, se cosechaban entre 15 y 20 hectáreas, ahora nada más de 3 a 4 hectáreas”, comentó Domingo Silva, productor de café.
- “Las causas de este problema son diversas, la principal es el cambio climático. La escasez de agua, que nos llueve fuera de tiempo”, dijo Domingo Silva.
- Entonces, el clima de una zona ya no es el mismo que hace 10 o 15 años y esto también los mismos productores lo observan, ya que en algunas zonas los árboles se están secando”, dijo Homero Bustamante, productor de café.
- Además las plantas de café se han vuelto más susceptibles a las enfermedades.
- “Algunas aves de la zona caliente ahora se pasan a la zona media y algunas plagas también se han desarrollado más como la broca del café”, agregó Homero Bustamante.

Yields are declining at low altitudes

Finca San Luis, Ciudad Colón 750 m asl, Costa Rica (1988 -1999)
Luis A. Fournier, José Fco. Di Stefano

\[ y = -0.2376x + 69.504 \]
\[ R^2 = 0.4259 \]
The times they are a-changing

- If coffee is going to survive in many countries and cope with problems like CBB, it needs a thorough review of where and how it is grown
- Strategic withdrawals from lower areas – adaptation in higher zones
- Every aspect of coffee growing needs to be reconsidered from nursery to mill
  - how to get down labour costs
  - how to get down energy costs
  - how to cope with too little/too much water
- There are a lot of possibilities – needs considerable research, development, investment

So welcome to the world of post-normal science

- We can’t go on as we have been
- Pretending we are in a static unchanging world where a problem has a straight-forward matching solution
- The world is changing very fast in many ways and coffee is going to change too
- Controlling CBB and remaining profitable in a changing future is like trying to hit a moving target

So welcome to the world of post-normal science

- In many countries CBB control has not been very successful, mostly an institutional failure – major reductions in budgets in recent years, just as production problems started to mount
- In retrospect we will see the millennial coffee crisis as the start of ‘the great transformation’
- We are going to need much stronger institutions to solve our problems in the future

Its not just CBB

- Causes:
  - Management: all forests are roughly the same age
  - Climate: A decade of drought has weakened the trees
  - Climate: hard winters have softened, which allows the beetles to flourish and expand their range

- USA losses to Mountain Pine Beetle
  - Montana = 1 million ha pine trees dead last year
  - Wyoming & Colorado 2006 = 1 million ha dead
  - Wyoming & Colorado 2007 = 1.5 million ha dead
  - Wyoming & Colorado 2008 = 2 million ha dead (est.)
  - Colorado in next 3 to 5 yrs – estimates 5 m ha dead
- Canada: by 2020 the pine beetle outbreak will have released 270 mega-tonnes of CO₂ into the atmosphere from Canadian forests.

“I’ve literally had people in my office crying.”
Gary Ellingson, forestry consultant [NYT 18th Nov 2008]
Take-home message

- Think of the coffee berry borer not as a single problem
- But as a symptom of a much bigger problem
- We can't treat this as an issue where we are trying to restore the \textit{status quo ante}
- Things will never be the same again

Thank you