

# Potato taste defect

Impacts of the Antestia bug and overview of mitigation efforts

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## Introduction

Potato taste defect (PTD) is a coffee quality defect very often encountered in coffee from the Great Lakes region of Central Africa, mainly Rwanda, Burundi, Congo, Uganda, and less frequently Tanzania and Kenya. As the name suggests, coffee beans with PTD will smell like freshly peeled potatoes when roasted and ground. This quality defect compromises the quality and commercial potential of these coffees when found. There are no health risks posed by this defect, but a single bean exhibiting PTD can ruin an entire bag of coffee (Cain et al., 2021; Church, 2018; Jackels et al., 2014).

While the details of the exact biochemical mechanism behind PTD are still under study, there is no doubt that the PTD is associated with damage coming from the Antestia bug (multiple species in the genus *Antestiopsis*). Therefore, all of the PTD mitigation efforts have been focused on preventing damage from the Antestia bug in the coffee crop, or in the post-harvest phase, where damaged beans are identified and removed. We'll review what we know of the defect and how producers and exporters are dealing with this issue.





## Impact

Potato Taste Defect is a quality defect present in brewed coffee, offering a strong odor of peeled, raw potatoes. It has been linked to the presence of two odor-producing chemicals, 2-isopropyl-3-methoxypyrazine (IPMP) and 2-isobutyl-3-methoxypyrazine (IBMP) (Becker et al., 2014). IPMP and IBMP are secondary effects of physical damage to the green bean caused by the Antestia bug. While the exact mechanism is not yet agreed upon, these compounds are thought to be produced by bacteria that colonize the surfaces of the damaged coffee bean (Bouyjou et al., 1999).

PTD has had a high economic impact on East African coffee producers, as PTD reduces the value of coffee. Frequently international buyers generalize the coffees from these regions and offer lower prices, with or without specific evidence of PTD in the coffee batches (Gerard and Bigirimana, 2018). According to a representative of Counter Culture Coffee (CCC), the price of a good coffee can be reduced by up to 57% when the coffee presents PTD (Church, 2018). Only a few beans may be affected in one tree, yet in the process of roasting, grinding and brewing, the entire batch/bag/pot will be affected. It is only in the sensory evaluation that these defects are found.

## Farm management for potato taste defect

Given the strong link with Antestia bug damage there are two approaches to mitigating PTD. One is in the field, through the agronomic management of the pest itself. While farmers cannot control the environmental conditions that favor the reproductive cycles of the Antestia bugs, there are a number of good agricultural practices that minimize the impact and potential hosts of the pest.

- **Removal of all fruit from the trees at the end of harvest.** This is a key practice to limit reproductive sites for coffee berry borer as well. This eliminates food sources for pests and helps limit their proliferation. There needs to be a final harvest of any black/diseased/shrunken fruit, discourage insects from hanging around the farm year-round.
- **Targeted pest control with pyrethrums.** Pyrethrum is a natural insecticide derived from dried chrysanthemum flowers, and is effective when used in combination of other cultural practices to control pests. (Bigirimana et al., 2018; Babin et al., 2018; Mendesil and Abdeta, 2007; Mendesil, Tedesse and Negash, 2012)
- **Vegetative management in the farm.** Ensuring that the coffee plants are not overgrown, that weeds and shade canopy are managed are also key management practices to help limit the spread of the Antestia bug. The bug prefers dense foliage and shade, avoiding direct sunlight, therefore pruning opens up coffee trees and creates unfavorable conditions for the bug; it also improves pesticide penetration and effectiveness. Pruning results in a significant reduction in the amount of damaged coffee beans and berry loss due to the Antestia bug and helps trees maintain their vigor, which improves resistance to infestations. (Bigirimana et al., 2018; Feed the Future, 2017; Bigirimana et al., 2019).
- **Integrated Pest Management.** Pruning when combined with smart timing of pesticides (Right Time, Right Dose, Right Amount) increases the efficacy of the control and keeps the cost of application to a minimum. (Bigirimana et al., 2018)





## Post-harvesting processing for potato taste defect

The second approach to mitigating the impact of PTD is through quality control measures during post-harvest processing.

- At the wetmill, coffee cherries can be floated, separating the damaged beans, which will be less dense and will float to the surface of the water. (Kornman, 2018)
- After the demucilagation / fermentation some of the color defects are more clearly visible and need to be removed. (Kornman, 2018)
- There is anecdotal evidence that using commercial yeasts can help outcompete the bacteria implicated in PTD.
- Insect damaged beans can be removed by hand during drying, or after hulling. Additionally, laser sorting technology can be used. In Rwanda, UV lights are used to detect insect damaged beans for sorting. (Kornman, 2018)

These strict quality protocols improve the overall quality of coffee, but also help limit the impact of PTD.

## Roasting and brewing

If you are working with coffee that you suspect may have PTD, there are suggestions that help minimize the impact of PTD, primarily focused on decreasing the batch sizes.

- Increase the number of samples to be cupped in order to adequately screen the coffee
- Grind smaller amounts (30g rather than 100g). Should there be PTD present, then the grinder can be purged with other coffees and the contaminated batch disposed of.
- Educating consumers and baristas. One PTD batch does not mean the rest of the bag is similarly contaminated. It takes just one bean to ruin the entire brew, so consumers know



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