### Tree Canopy Cover and Coffee Leaf Rust

By: www.BuyOrganicCoffee.org

Coffee grows naturally in the shade. Thus a tree canopy that is natural or made up of crops like plantain results in shade grown coffee. However, coffee leaf rust is a serious fungal disease that threatens coffee crops. Coffee leaf rust thrives on moisture. Thus, if a tree canopy cover increases leaf moisture it could result in more coffee leaf rust and defeat the purpose of the canopy in the first place. What is the relationship between tree canopy cover and coffee leaf rust?

#### On Site Study of Coffee Leaf Rust and Tree Canopy Cover

Fortunately the issue of how tree canopy cover affects or does not affect coffee leaf rust infestations has been studied. Tree effects on coffee leaf rust were studied from Latin America and Africa. Issues looked at included interactions of trees and plant diseases such as fungi and specifically coffee leaf rust. It turns out that trees can both inhibit and promote coffee leaf rust on coffee plants growing beneath the tree canopy. There are specific tree leaf traits and canopy characteristics that reduce the risk of coffee leaf rust. These include thin canopies with lots of openness, short tree height, small and dentate leaves, and horizontal branching.

#### Trees and Coffee Diseases

Coffee leaf rust is not the only coffee disease affected by trees. Others include American leaf spot disease of coffee, Armillaria root rot or Pink Disease, Coffee leaf scorch or Brown Eye Spot, Dieback syndrome, phoma leaf blight, and coffee berry disease. A major factor for some of these fungal diseases is that the tree canopy inhibits leaf drying and thus provides a home for the fungal disease. For others the tree canopy and especially trees at the edge of the farm that slow wind speeds protect against distant wind borne fungus entering the coffee growing area.

#### Different Trees for Different Purposes for Inhibiting Leaf Rust

Trees that let more light through the canopy are useful for coffee plants beneath them. However, on the edges of a coffee farm it works well to have large trees with huge canopies, waxy, thick, small leaves that reduce wind speeds that reach the interior coffee growing area. Pruning trees every year to maintain the ideal characteristics is ideal. Data in this study came from onsite observations in real coffee farms under real conditions over years. The ideal situation on any given coffee farm is typically obtained after trial and error over the years. General principles will, however, apply. Too much moisture encourages fungal growth. Thus a balance needs to be struck between the benefits of growing coffee in the shade and letting moisture remain too long on coffee leaves.

#### Which Trees Do Coffee Farmers Use and Why?

In any given area there are a lot of possible tree species to use to provide shade for coffee. However, in any given region there are a handful of favorites used by coffee farmers. This is usually for a preference for

nitrogen-fixing varieties, ones that are easy to prune, ones that produce fruit, or ones that can be cut down for sale as timber. As a practical matter, coffee farmers will typically use the tree varieties that they and their family have always used unless problems arise.

The bottom line for a coffee farmer who uses trees to grow coffee in the shade is that they need to pay attention, prune the canopy as needed, and clean up the sorts of clutter that promote fungal plant diseases.

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