

Coffee: ecology in the marketplace

The lovely cerulean warbler – lazily singing in the summer forests of eastern North America – is suffering one of the sharpest declines of any migratory songbird. One likely cause is the species' penchant for wintering in the ecologically fragile, mid-elevation forests of the South American Andes. This region is suffering tremendous rates of deforestation and remains critically threatened, yet it is crucial to the maintenance of global biological diversity. For the ceruleans, and a host of other tropical organisms around the world, coffee farms with diverse tree canopies offer a glimmer of hope. Although not a replacement for native forest, shade coffee can provide the last refuge for species threatened by the removal of original forest cover.

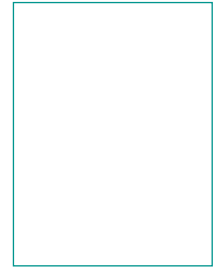
Yet, in the face of competition from the spread of high-tech, sun coffee farms, the future of traditional shade coffee is by no means secure. While it is true that the sun system, with its high agrochemical inputs, produces a lot of beans, coffee is a luxury commodity, where quality can often trump quantity in the marketplace. With the growth of the specialty coffee industry, the variety of coffee purchased makes a loud statement about its purchaser. Coffee drinkers concerned with environmental protection can make a difference by including shade as one criterion for defining a good cup of coffee.

The good news is that the label “shade-grown” has begun to appear more frequently on bags of retail coffee. However, in order to keep the shade grown concept from becoming a greenwashing slogan, its scientific integrity must be continually reassessed. Most importantly, to give teeth to the shade-coffee concept, management principles must be applied, along with transparent, independent, third-party inspection. This will result in certified coffee that provides market access and (often) price premiums to the farmers, who are the ultimate stewards of the land. The two third-party-certified shade coffees (Smithsonian Migratory Bird Center Bird-Friendly and Rainforest Alliance Certified) will penetrate the marketplace only if consumers are educated about the need for science and verification as important components of the products they purchase.

The need for a scientifically sound basis for labeling is particularly important for shade-grown coffee. Although claims in the marketplace focus simply on shade versus sun coffee, the presence of shade trees in and of itself does not make for an ecologically diverse system. In many regions, “shade” coffee is grown under only a few tree species that support little biodiversity. Coffee farms fall along a gradient of systems defined by the diversity of the forest cover, from full sun to an unmanaged forest canopy where coffee has simply been inserted into natural forest. Rather than focusing strictly on a sun–shade dichotomy, current certification systems strive to identify a range of systems that achieve a balance in which biodiversity is protected while the ability of farmers to produce an economically sustainable quantity of coffee beans is maintained.

The standards of certification systems are only as good as the available information. Clearly, much remains to be learned. We need rigorous scientific approaches to pinpoint the features of the coffee agroecosystem that play a crucial role in supporting biological diversity. As a managed and artificial system, coffee agroforests are ideal for studies exploring ecological, economic, and silvicultural properties of shade trees and other aspects of management. The shade-coffee system, and other similar agroforestry systems, also provide excellent laboratories for developing and testing basic tenets of the ecology of the tropics as a whole (a topic explored in an upcoming Special Feature in *Ecology*). Luckily, many tropical ecologists are beginning to focus on these questions, and greater collaboration between ecologists and coffee agronomists could make for a rich intellectual partnership.

In the long run, management of coffee farms to protect migratory birds, biological diversity, and a healthy environment should be the industry standard – the way business is done. Yet, without support from the coffee industry and consumers, the effort to promote shade-grown coffee will devolve into an advertising slogan placed on a green boutique product. This unfortunate outcome will only be avoided if consumers demand shade-grown coffee, while seeking out coffee containing third-party certified seals based on solid ecological research. We believe that, with a growth in demand for shade-certified coffee, the focus of ecological science on the coffee farm will result in a victory for the cerulean warbler and the myriad tropical species threatened by the loss of mid-elevation tropical forests, as well as for our understanding of basic tropical ecology.



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