

Peer-reviewed literature on coffee growing

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- Abreu, E.C., E. Borgomeo, R.F. dos Santos, J.P. Metzger, and G. Sparovek. 2015. Does certification improve biodiversity conservation in Brazilian coffee farms? *Forest Ecology and Management* 357:181–194.
- Afrifa, A.A., K. Ofori-Frimpong, M.R. Appiah, and B.J. Halm. 2003. Effects of mulching on soil nutrients and yield of Robusta coffee. *Tropical Agriculture* 80:105–109.
- Aguilar, V., C. Staver, and P. Milberg. 2003. Weed vegetation response to chemical and manual selective ground cover management in a shaded coffee plantation. *Weed Research* 43:68–75.
- Albertin, A., and P. Nair. 2004. Farmers' perspectives on the role of shade trees in coffee production systems: an assessment from the Nicoya Peninsula, Costa Rica. *Human Ecology* 32:443–463.
- Ambinakudige, S., and J. Choi. 2009. Global coffee market influence on land-use and land-cover change in the Western Ghats Of India. *Land Degradation & Development* 20:327–335.
- Ambinakudige, S., and B. Sathish. 2009. Comparing tree diversity and composition in coffee farms and sacred forests in the Western Ghats of India. *Biodiversity and Conservation* 18:987–1000.
- Anand, M.O., J. Krishnaswamy, and A. Das. 2008. Proximity to forests drives bird conservation value of coffee plantations: implications for certification. *Ecological Applications* 18:1754–1763.
- Anthony, F., B. Bertrand, O. Quiros, A. Wilches, P. Lashermes, J. Berthaud, and A. Charrier. 2001. Genetic diversity of wild coffee (*Coffea arabica* L.) using molecular markers. *Euphytica* 118:53–65.
- Araujo, W.L., P.C. Dias, G.A.B.K. Moraes, E.F. Celin, R.L. Cunha, R.S. Barros, and F.M. DaMatta. 2008. Limitations to photosynthesis in coffee leaves from different canopy positions. *Plant Physiology and Biochemistry* 46:884–890.
- Arellano, L., M.E. Favila, and C. Huerta. 2005. Diversity of dung and carrion beetles in a disturbed Mexican tropical montane cloud forest and on shade coffee plantations. *Biodiversity and Conservation* 14:601–615.
- Arias, R., G. Heredia-Abarca, V. Aguilar, and L. Fuentes-Ramírez. 2012. Diversity and abundance of arbuscular mycorrhizal fungi spores under different coffee production systems and in a tropical montane cloud forest patch in Veracruz, Mexico. *Agroforestry Systems* 85:179–193.
- Aristizábal, L.F., M. Jiménez, A.E. Bustillo, H.I. Trujillo, and S.P. Arthurs. 2015. Monitoring Coffee Berry Borer, *Hypothenemus hampei* (Coleoptera: Curculionidae), Populations with Alcoholbaited Funnel Traps in Coffee Farms in Colombia. *Florida Entomologist* 98:381–383.
- Armbrecht, I., and M.C. Gallego. 2007. Testing ant predation on the coffee berry borer in shaded and sun coffee plantations in Colombia. *Entomologia Experimentalis et Applicata* 124:261–267.
- Armbrecht, I., I. Perfecto, and E. Silverman. 2006. Limitation of nesting resources for ants in Colombian forests and coffee plantations. *Ecological Entomology* 31:403–410.
- Armbrecht, I., L. Rivera, and I. Perfecto. 2005. Reduced diversity and complexity in the leaf-litter ant assemblage of Colombian coffee plantations. *Conservation Biology* 19:897–907.

- Arrueta, G., A. Hernández, and A.M. Espinoza. 2004. Diversity of *Bacillus thuringiensis* strains isolated from coffee plantations infested with the coffee berry borer *Hypothenemus hampei*. *Revista de Biología Tropical* 52:757–764.
- Van Asten, P.J.A., L.W.I. Wairegi, D. Mukasa, and N.O. Uringi. 2011. Agronomic and economic benefits of coffee-banana intercropping in Uganda's smallholder farming systems. *Agricultural Systems* 104:326–334.
- Ataroff, M., and M. Monasterio. 1997. Soil erosion under different management of coffee plantations in the Venezuelan Andes. *Soil Technology* 11:95–108.
- Avelino, J., A. Romero-Gurdián, H.F. Cruz-Cuellar, and F.A. Declerck. 2012. Landscape context and scale differentially impact coffee leaf rust, coffee berry borer, and coffee root-knot nematodes. *Ecological Applications* 22:584–596.
- Avelino, J., L. Willocquet, and S. Savary. 2004. Effects of crop management patterns on coffee rust epidemics. *Plant Pathology* 53:541–547.
- Babbar, L.I., and D.R. Zak. 1994. Nitrogen cycling in coffee agroecosystems: net N mineralization and nitrification in the presence and absence of shade trees. *Agriculture, Ecosystems & Environment* 48:107–113.
- Babbar, L.I., and D.R. Zak. 1995. Nitrogen loss from coffee agroecosystems in Costa Rica: Leaching and denitrification in the presence and absence of shade trees. *Journal of Environmental Quality* 24:227–233.
- Bacca, T., E.R. Lima, M.C. Picanco, R.N.C. Guedes, and J.H.M. Viana. 2008. Sampling plan for the coffee leaf miner *Leucoptera coffeella* with sex pheromone traps. *Journal of Applied Entomology* 132:430–438.
- Bacon, c. m., Ernesto Mendez, V., F.-G. E. M., J. Stuart, and Diaz Flores, S. R. 2008. Are sustainable coffee certifications enough to secure farmer livelihoods? The Millenium Development Goals and Nicaragua's Fair Trade cooperatives. *Globalizations* 5:259–274.
- Bacon, C. 2005. Confronting the coffee crisis: can Fair Trade, organic, and specialty coffees reduce small-scale farmer vulnerability in northern Nicaragua? *World Development* 33:497–511.
- Baggio, A.J., P.H. Caramori, A. Androcioli Filho, and L. Montoya. 1997. Productivity of Southern Brazilian coffee plantations shaded by different stockings of *Grevillea robusta*. *Agroforestry Systems* 37:111–120.
- Baker, P.S., J.F. Barrera, and A. Rivas. 1992. Life-history studies of the coffee berry borer (*Hypothenemus hampei*, Scolytidae) on coffee trees in southern Mexico. *Journal of Applied Ecology* 29:656–662.
- Bakermans, M., A. Rodewald, A. Vitz, and C. Rengifo. 2012. Migratory bird use of shade coffee: the role of structural and floristic features. *Agroforestry Systems* 85:85–94.
- Bakermans, M.H., A.C. Vitz, A.D. Rodewald, and C.G. Rengifo. 2009. Migratory songbird use of shade coffee in the Venezuelan Andes with implications for conservation of cerulean warbler. *Biological Conservation* 142:2476–2483.
- Bali, A., A. Kumar, and J. Krishnaswamy. 2007. The mammalian communities in coffee plantations around a protected area in the Western Ghats, India. *Biological Conservation* 139:93–102.
- Bandeira, F.P., C. Martorell, J.A. Meave, and J. Caballero. 2005. The role of rustic coffee plantations in the conservation of wild tree diversity in the Chinantec region of Mexico. *Biodiversity and Conservation* 14:1225–1240.
- Barham, B.L., M. Callenes, S. Gitter, J. Lewis, and J. Weber. 2011. Fair Trade/Organic Coffee, Rural Livelihoods, and the "Agrarian Question": Southern Mexican Coffee Families in Transition. *World Development* 39:134–145.
- Barham, B.L., and J.G. Weber. 2012. The economic sustainability of certified coffee: recent evidence from Mexico and Peru. *World Development* 40:1269–1279.

- Barradas, V.L., and L. Fanjul. 1986. Microclimatic characterization of shaded and open-grown coffee (*Coffea arabica* L.) plantations in Mexico. *Agricultural and Forest Meteorology* 38:101–112.
- De Beenhouwer, M., R. Aerts, and O. Honnay. 2013. A global meta-analysis of the biodiversity and ecosystem service benefits of coffee and cacao agroforestry. *Agriculture, Ecosystems & Environment* 175:1–7.
- De Beenhouwer, M., L. Geeraert, J. Mertens, M. Van Geel, R. Acuña Castillo, K. Vanderhaegen, and O. Honnay. 2016. Biodiversity and carbon storage co-benefits of coffee agroforestry across a gradient of increasing management intensity in the SW Ethiopian highlands. *Agriculture, Ecosystems & Environment* 222:193–199.
- Beer, J., R. Muschler, D. Kass, and E. Somarriba. 1997. Shade management in coffee and cacao plantations. *Agroforestry Systems* 38:139–164.
- Beuchelt, T.D., and M. Zeller. 2011. Profits and poverty: Certification's troubled link for Nicaragua's organic and fairtrade coffee producers. *Ecological Economics* 70:1316–1324.
- Bitzer, V., M. Francken, and P. Glasbergen. 2008. Intersectoral partnerships for a sustainable coffee chain: Really addressing sustainability or just picking (coffee) cherries? *Global Environmental Change* 18:271–284.
- Blackman, A., H.J. Albers, B. Avalos-Sartorio, and L. Crooks Murphy. 2008. Land cover in a managed forest ecosystem: Mexican shade coffee. *American Journal of Agricultural Economics* 90:216–231.
- Blackman, A., and M.A. Naranjo. 2012. Does eco-certification have environmental benefits? Organic coffee in Costa Rica. *Ecological Economics* 83:60–68.
- Blackman, A., and J. Rivera. 2011. Producer-Level Benefits of Sustainability Certification. *Conservation Biology* 25:1176–1185.
- Borkhataria, R., J.A. Collazo, M.J. Groom, and A. Jordan-Garcia. 2012. Shade-grown coffee in Puerto Rico: Opportunities to preserve biodiversity while reinvigorating a struggling agricultural commodity. *Agriculture, Ecosystems & Environment* 149:164–170.
- Borkhataria, R.R., J.A. Collazo, and M.J. Groom. 2006. Additive effects of vertebrate predators on insects in a Puerto Rican coffee plantation. *Ecological Applications* 16:696.
- Borkhataria, R.R., J.A. Collazo, and M.J. Groom. 2012. Species abundance and potential biological control services in shade vs. sun coffee in Puerto Rico. *Agriculture, Ecosystems & Environment* 151:1–5.
- Bosselmann, A.S., K. Dons, T. Oberthur, C.S. Olsen, A. Raebild, and H. Usma. 2009. The influence of shade trees on coffee quality in small holder coffee agroforestry systems in Southern Colombia. *Agriculture, Ecosystems & Environment* 129:253–260.
- Bosselmann, A.S. 2012. Mediating factors of land use change among coffee farmers in a biological corridor. *Ecological Economics* 80:79–88.
- Bravo-Monroy, L., S.G. Potts, and J. Tzanopoulos. 2016. Drivers influencing farmer decisions for adopting organic or conventional coffee management practices. *Food Policy* 58:49–61.
- Bravo-Monroy, L., J. Tzanopoulos, and S.G. Potts. 2015. Ecological and social drivers of coffee pollination in Santander, Colombia. *Agriculture, Ecosystems & Environment* 211:145–154.
- Bray, D.B., J.L. Plaza-Sánchez, and E. Contreras-Murphy. 2002. Social dimensions of organic coffee production in Mexico: lessons for eco-labeling initiatives. *Society & Natural Resources* 15:429–446.
- Briggs, H.M., I. Perfecto, and B.J. Brosi. 2013. The role of the agricultural matrix: coffee

- management and Euglossine bee (Hymenoptera: Apidae: Euglossini) communities in southern Mexico. *Environmental Entomology* 42:1210–1217.
- Brown, J.S., J.H. Whan, M.K. Kenny, and P.R. Merriman. 1995. The effect of coffee leaf rust on foliation and yield of coffee in Papua New Guinea. *Crop Protection* 14:589–592.
- Brun, L.O., J. Stuart, V. Gaudichon, K. Aronstein, and R.H. French-Constant. 1995. Functional haplodiploidy: a mechanism for the spread of insecticide resistance in an important international insect pest. *PNAS* 92:9861–9865.
- Bucagu, C., B. Vanlauwe, and K.E. Giller. 2013. Managing Tephrosia mulch and fertilizer to enhance coffee productivity on smallholder farms in the Eastern African Highlands. *European Journal of Agronomy* 48:19–29.
- Buechley, E.R., C.H. Şekercioğlu, A. Atickem, G. Gebremichael, K.K. Ndungu, B. Mahamued, T. Beyene, T. Mekonnen, and L. Lens. 2015. Importance of Ethiopian shade coffee farms for forest bird conservation. *Biological Conservation* 188:50–60. Special Issue: Ecology and Conservation of Avian Insectivores of the Rainforest Understory: A Pan-Tropical Perspective.
- Burbano, E.G., M.G. Wright, N.E. Gillette, S. Mori, N. Dudley, T. Jones, and M. Kaufmann. 2012. Efficacy of traps, lures, and repellents for *Xylosandrus compactus* (Coleoptera: Curculionidae) and other ambrosia beetles on *Coffea arabica* plantations and *Acacia koa* nurseries in Hawaii. *Environmental Entomology* 41:133–140.
- Burdine, J.D., G.H. Domínguez Martínez, and S.M. Philpott. 2014. Predictors of Leafhopper Abundance and Richness in a Coffee Agroecosystem in Chiapas, Mexico. *Environmental Entomology* 43:328–335.
- Calvo, L., and J. Blake. 1998. Bird diversity and abundance on two different shade coffee plantations in Guatemala. *Bird Conservation International* 8:297–308.
- Campanha, M.M., R.H.S. Santos, G.D. de Freitas, H.E.P. Martinez, S.K.R. Garcia, and F.L. Finger. 2004. Growth and yield of coffee plants in agroforestry and monoculture systems in Minas Gerais, Brazil. *Agroforestry Systems* 63:75–82.
- Cannavo, P., J. Sansoulet, J.-M. Harmand, P. Siles, E. Dreyer, and P. Vaast. 2011. Agroforestry associating coffee and *Inga densiflora* results in complementarity for water uptake and decreases deep drainage in Costa Rica. *Agriculture, Ecosystems & Environment* 140:1–13.
- Carlo, T.A., J.A. Collazo, and M.M.J. Groom. 2004. Influences of fruit diversity and abundance on bird use of two shaded coffee plantations. *Biotropica* 36:602–614.
- Carsan, S., A. Stroebel, I. Dawson, R. Kindt, F. Swanepoel, and R. Jamnadass. 2013. Implications of shifts in coffee production on tree species richness, composition and structure on small farms around Mount Kenya. *Biodiversity and Conservation* 22:2919–2936.
- Castellanos, E.J., C. Tucker, H. Eakin, H. Morales, J.F. Barrera, and R. Díaz. n.d. Assessing the adaptation strategies of farmers facing multiple stressors: Lessons from the Coffee and Global Changes project in Mesoamerica. *Environmental Science & Policy*. Available online at <http://www.sciencedirect.com/science/article/pii/S1462901112000974>. Accessed July 27, 2012.
- Castro, L.M., B. Calvas, P. Hildebrandt, and T. Knoke. 2013. Avoiding the loss of shade coffee plantations: how to derive conservation payments for risk-averse land-users. *Agroforestry Systems* 87:331–347.
- Castro-Tanzi, S., T. Dietsch, N. Urena, L. Vindas, and M. Chandler. 2012. Analysis of management and site factors to improve the sustainability of smallholder coffee production in Tarrazú, Costa Rica. *Agriculture, Ecosystems & Environment*

- 155:172–181.
- Caudill, S.A., F.J. DeClerck, and T.P. Husband. 2015. Connecting sustainable agriculture and wildlife conservation: Does shade coffee provide habitat for mammals? *Agriculture, Ecosystems & Environment* 199:85–93.
- Caudill, S.A., P. Vaast, and T.P. Husband. 2014. Assessment of small mammal diversity in coffee agroforestry in the Western Ghats, India. *Agroforestry Systems* 88:173–186.
- Cerdán, C.R., M.C. Rebolledo, G. Soto, B. Rapidel, and F.L. Sinclair. 2012. Local knowledge of impacts of tree cover on ecosystem services in smallholder coffee production systems. *Agricultural Systems* 110:119–130.
- Chaves, B., and J. Riley. 2001. Determination of factors influencing integrated pest management adoption in coffee berry borer in Colombian farms. *Agriculture, Ecosystems & Environment* 87:159–177. *Papers from the European Union Concerted Action: Unification of Indicator Quality for the Assessment of Impact of Multidisciplinary Systems (UNIQUAIMS)*.
- Classen, A., M.K. Peters, S.W. Ferger, M. Helbig-Bonitz, J.M. Schmack, G. Maassen, M. Schleuning, E.K.V. Kalko, K. Böhning-Gaese, and I. Steffan-Dewenter. 2014. Complementary ecosystem services provided by pest predators and pollinators increase quantity and quality of coffee yields. *Proceedings of the Royal Society B: Biological Sciences* 281:20133148.
- Coltro, L., A. Mourad, P. Oliveira, J. Baddini, and R. Kletecke. 2006. Environmental profile of Brazilian green coffee. *The International Journal of Life Cycle Assessment* 11:16–21.
- Cook, R.T.A., and J.L. Pereira. 1976. Strains of *Colletotrichum coffeanum*, the causal agent of coffee berry disease, tolerant to benzimidazole compounds in Kenya. *Annals of Applied Biology* 83:365–379.
- Correia, M., M. Diabaté, P. Beavogui, K. Guilavogui, N. Lamanda, and H. Foresta. 2010. Conserving forest tree diversity in Guinée Forestière (Guinea, West Africa): the role of coffee-based agroforests. *Biodiversity and Conservation* 19:1725–1747.
- Cortés-Delgado, N., and V.J. Sosa. 2014. Do Bats Roost and Forage in Shade Coffee Plantations? A Perspective from the Frugivorous Bat *Sturnira hondurensis*. *Biotropica* 46:624–632.
- Craparo, A.C.W., P.J.A. Van Asten, P. Läderach, L.T.P. Jassogne, and S.W. Grab. 2015. *Coffea arabica* yields decline in Tanzania due to climate change: Global implications. *Agricultural and Forest Meteorology* 207:1–10.
- Cruz-Angon, A., and R. Greenberg. 2004. Are epiphytes important for birds in coffee plantations? An experimental assessment. *Journal of Applied Ecology* 42:150–159.
- Cruz-Angon, A., T.S. Sillett, and R. Greenberg. 2008. An experimental study of habitat selection by birds in a coffee plantation. *Ecology* 921–927.
- D'haeze, D., D. Raes, J. Deckers, T.A. Phong, and H.V. Loi. 2005. Groundwater extraction for irrigation of *Coffea canephora* in Ea Tul watershed, Vietnam—a risk evaluation. *Agricultural Water Management* 73:1–19.
- DaMatta, F.M., A.R.M. Chaves, H.A. Pinheiro, C. Ducatti, and M.E. Loureiro. 2003. Drought tolerance of two field-grown clones of *Coffea canephora*. *Plant Science* 164:111–117.
- DaMatta, F.M., and C.D. Ramalho Cochicho. 2006. Impacts of drought and temperature stress on coffee physiology and production: a review. *Brazilian Journal of Plant Physiology* 18:55–81.
- DaMatta, F.M. 2004. Ecophysiological constraints on the production of shaded and unshaded coffee: a review. *Field Crops Research* 86:99–114.

- Damon, A. 2000. A review of the biology and control of the coffee berry borer, *Hypothenemus hampei* (Coleoptera: Scolytidae). *Bulletin of Entomological Research* 90:453–465.
- Davidson, S. 2005. Shade coffee agro-ecosystems in Mexico -- A synopsis of the environmental services and socio-economic considerations. *Journal of Sustainable Forestry* 21:81.
- Davis, A.P., R. Govaerts, D.M. Bridson, and P. Stoffelen. 2006. An annotated taxonomic conspectus of the genus *Coffea* (Rubiaceae). *Botanical Journal of the Linnean Society* 152:465–512.
- Davis, A.P., and F. Rakotonasolo. 2008. A taxonomic revision of the baracoffea alliance: nine remarkable *Coffea* species from western Madagascar. *Botanical Journal of the Linnean Society* 158:355–390.
- Decazy, F., J. Avelino, B. Guyot, J.J. Perriot, C. Pineda, and C. Cilas. 2003. Quality of different Honduran coffees in relation to several environments. *Journal of Food Science* 68:2356–2361.
- Van Der Vossen, H.A.M. 2005. A critical analysis of the agronomic and economic sustainability of organic coffee production. *Experimental Agriculture* 41:449–473.
- Van Der Vossen, H.A.M. 2009. The cup quality of disease-resistant cultivars of arabica coffee (*Coffea arabica*). *Experimental Agriculture* 45:323–332.
- Dietsch, T., and S.M. Philpott. 2008. Linking consumers to sustainability: incorporating science into eco-friendly certification. *Globalizations* 5:247–258.
- Dietsch, T.V., I. Perfecto, and R. Greenberg. 2007. Avian foraging behavior in two different types of coffee agrosystem in Chiapas, Mexico. *Biotropica* 39:232–240.
- Dietsch, T.V. 2008. Relationship between avian foraging behavior and infestation by Trombiculid larvae (Acari) in Chiapas, Mexico. *Biotropica* 40:196–202.
- Dolia, J., M.S. Devy, N.A. Aravind, and A. Kumar. 2008. Adult butterfly communities in coffee plantations around a protected area in the Western Ghats, India. *Animal Conservation* 11:26–34.
- Donovan, J., and N. Poole. 2014. Changing asset endowments and smallholder participation in higher value markets: Evidence from certified coffee producers in Nicaragua. *Food Policy* 44:1–13.
- Dossa, E.L., E.C.M. Fernandes, W.S. Reid, and K. Ezui. 2008. Above- and belowground biomass, nutrient and carbon stocks contrasting an open-grown and a shaded coffee plantation. *Agroforestry Systems* 72:103–115.
- Dulloo, M.E., L. Guarino, F. Engelmann, N. Maxted, J.H. Newbury, F. Attere, and B.V. Ford-Lloyd. 1998. Complementary conservation strategies for the genus *Coffea*: A case study of Mascarene *Coffea* species. *Genetic Resources and Crop Evolution* 45:565–579.
- Eakin, H., C. Tucker, and E. Castellanos. 2006. Responding to the coffee crisis: a pilot study of farmers' adaptations in Mexico, Guatemala and Honduras. *Geographical Journal* 172:156–171.
- Eakin, H., A. Winkels, and J. Sendzimir. 2009. Nested vulnerability: exploring cross-scale linkages and vulnerability teleconnections in Mexican and Vietnamese coffee systems. *Environmental Science & Policy* 12:398–412.
- Ellis, E.A., K.A. Baerenklau, R. Marcos-Martínez, and E. Chávez. 2010. Land use/land cover change dynamics and drivers in a low-grade marginal coffee growing region of Veracruz, Mexico. *Agroforestry Systems* 80:61–84.
- Escalante, E.E. 1995. Coffee and agroforestry in Venezuela. *Agroforestry Today* 7:5–7.
- Eskes, A.B. 1982. The effect of light intensity on incomplete resistance of coffee to *Hemileia vastatrix*. *Netherlands Journal of Plant Pathology* 88:191–202.
- Etienne, H., F. Anthony, S. Dussert, D. Fernandez, P. Lashermes, and B. Bertrand. 2002.

- Biotechnological applications for the improvement of coffee (*Coffea arabica* L.). In *Vitro Cellular & Developmental Biology* 38:129–138.
- Faure, G., J.-F. Le Coq, I. Vagneron, H. Hocdé, G.S. Muñoz, and M. Kessari. 2012. Strategies of coffee producers' organizations in Costa Rica toward environmental and social certification processes. *Cahiers Agricultures* 21:162–168.
- Fernandes, F.L., M.C. Picanço, M.E.S. Fernandes, R.B. Queiroz, V.M. Xavier, and H.E.P. Martinez. 2012. The Effects of Nutrients and Secondary Compounds of *Coffea arabica* on the Behavior and Development of *Coccus viridis*. *Environmental Entomology* 41:333–341.
- Fia, F.R.L., A.T. Matos, A.C. Borges, R. Fia, and P.R. Cecon. 2012. Treatment of wastewater from coffee bean processing in anaerobic fixed bed reactors with different support materials: performance and kinetic modeling. *Journal of Environmental Management* 108:14–21.
- Firman, I.D., and J.A.N. Wallis. 1965. Low-volume spraying to control coffee leaf rust in Kenya. *Annals of Applied Biology* 55:123–137.
- Fisher, C. 2007. Selling coffee, or selling out? Evaluating different ways to analyze the Fair-Trade system. *Culture & Agriculture* 29:78–88.
- Francesconi, W., P.K.R. Nair, D.J. Levey, J. Daniels, and L. Cullen, Jr. 2013. Butterfly distribution in fragmented landscapes containing agroforestry practices in Southeastern Brazil. *Agroforestry Systems* 87:1321–1338.
- Frank, E., H. Eakin, and D. Lopez-Carr. 2011. Social identity, perception and motivation in adaptation to climate risk in the coffee sector of Chiapas, Mexico. *Global Environmental Change* 21:66–76.
- Gallina, S., S. Mandujano, and A. Gonzalez-Romero. 1996. Conservation of mammalian biodiversity in coffee plantations of Central Veracruz, Mexico. *Agroforestry Systems* 33:13–27.
- Garcia-Estrada, C., A. Damon, C. Sanchez Hernandez, L. Soto-Pinto, and G. Ibarra Nunez. 2006. Bat diversity in montane rainforest and shaded coffee under different management regimes in southeastern Chiapas, Mexico. *Biological Conservation* 132:351–361.
- García-Estrada, C., A. Damon, C. Sánchez-Hernández, L. Soto-Pinto, and G. Ibarra-Núñez. 2012. Diets of frugivorous bats in montane rain forest and coffee plantations in southeastern Chiapas, Mexico. *Biotropica* 44:394–401.
- Gaveau, D.L., A., M. Linkie, Suyadi, P. Levang, and N. Leader-Williams. 2009. Three decades of deforestation in southwest Sumatra: Effects of coffee prices, law enforcement and rural poverty. *Biological Conservation* 142:597–605.
- Gay, C., F. Estrada, C. Conde, H. Eakin, and L. Villers. 2006. Potential impacts of climate change on agriculture: a case of study of coffee production in Veracruz, Mexico. *Climatic Change* 79:259–288.
- Geromel, C., L.P. Ferreira, F. Davrieux, B. Guyot, F. Ribeyre, M.B. dos Santos Scholz, L.F. Protasio Pereira, P. Vaast, D. Pot, T. Leroy, A.A. Filho, L.G. Esteves Vieira, P. Mazzafera, and P. Marraccini. 2008. Effects of shade on the development and sugar metabolism of coffee (*Coffea arabica* L.) fruits. *Plant Physiology and Biochemistry* 46:569–579.
- Giannetti, B.F., Y. Ogura, S.H. Bonilla, and C.M.V.B. Almeida. 2011. Emergy assessment of a coffee farm in Brazilian Cerrado considering in a broad form the environmental services, negative externalities and fair price. *Agricultural Systems* 104:679–688.
- Gichimu, B.M. 2012. Field screening of selected *Coffea arabica* L. genotypes against coffee leaf rust. *African Journal of Horticultural Science* 6. Available online at <http://hakenya.net/ajhs/index.php/ajhs/article/view/95>. Accessed May 22, 2013.
- Gillison, A.N., N. Liswanti, S. Budidarsono, M. Van Noordwijk, and T.P. Tomich. 2004.

- Impact of cropping methods on biodiversity in coffee agroecosystems in Sumatra, Indonesia. *Ecology and Society* 9:7 [online].
- Giovanucci, D., B. Lewin, R. Swinkels, and P. Varangis. 2004. Socialist Republic of Vietnam Coffee Sector Report. World Bank - Agriculture and Rural Development Department.
- Gleffe, J.D., J.A. Collazo, M.J. Groom, and L. Miranda-Castro. 2006. Avian reproduction and the conservation value of shaded coffee plantations. *Ornitologia Neotropical* 17:271–282.
- Gobbi, J.A. 2000. Is biodiversity-friendly coffee financially viable? An analysis of five different coffee production systems in western El Salvador. *Ecological Economics* 33:267–281.
- Godoy, R., and C. Bennett. 1988. Diversification among coffee smallholders in the highlands of South Sumatra, Indonesia. *Human Ecology* 16:397–420.
- Gole, T.W., T. Borsch, M. Denich, and D. Teketay. 2008. Floristic composition and environmental factors characterizing coffee forests in southwest Ethiopia. *Forest Ecology and Management* 255:2138–2150.
- Gonzalez, A.A., and R. Nigh. 2005. Smallholder participation and certification of organic farm products in Mexico. *Journal of Rural Studies* 21:449–460.
- Goodall, K.E., C. Bacon, and V.E. Mendez. 2015. Shade tree diversity, carbon sequestration, and epiphyte presence in coffee agroecosystems: A decade of smallholder management in San Ramón, Nicaragua. *Agriculture, Ecosystems & Environment* 199:200–206.
- Gordon, C., R. Manson, J. Sundberg, and A. Cruz-Angon. 2007. Biodiversity, profitability, and vegetation structure in a Mexican coffee agroecosystem. *Agriculture, Ecosystems, and Environment* 118:256–266.
- Gordon, C.E., B. McGill, G. Ibarra-Núñez, R. Greenberg, and I. Perfecto. 2009. Simplification of a coffee foliage-dwelling beetle community under low-shade management. *Basic and Applied Ecology* 10:246–254.
- Gove, A.D., K. Hylander, S. Nemomisa, and A. Shimelis. 2008. Ethiopian coffee cultivation--Implications for bird conservation and environmental certification. *Conservation Letters* 1:208–216.
- Greenberg, R., P. Bichier, A. Cruz-Angon, C. MacVean, R. Perez, and E. Cano. 2000. The impact of avian insectivory on arthropods and leaf damage in some Guatemalan coffee plantations. *Ecology* 81:1750–1755.
- Greenberg, R., P. Bichier, A. Cruz-Angon, and R. Reitsma. 1997. Bird populations in shade and sun coffee plantations in central Guatemala. *Conservation Biology* 11:448–459.
- Greenberg, R., P. Bichier, and J. Sterling. 1997. Bird populations in rustic and planted shade coffee plantations of eastern Chiapas, Mexico. *Biotropica* 29:501–514.
- Greenberg, R., R. Reitsma, and A.C. Cruz-Angon. 1996. Interspecific aggression by Yellow Warblers in a sun coffee plantation. *Condor* 98:640–642.
- Grossman, J.M. 2003. Exploring farmer knowledge of soil processes in organic coffee systems of Chiapas, Mexico. *Geoderma* 111:267–287.
- Guedes Pinto, L.F., T. Gardner, C.L.L. McDermott, and K.O.L. Ayub. 2014. Group certification supports an increase in the diversity of sustainable agriculture network-rainforest alliance certified coffee producers in Brazil. *Ecological Economics* 107:59–64.
- Guzmán, A., A. Link, J.A. Castillo, and J.E. Botero. 2016. Agroecosystems and primate conservation: Shade coffee as potential habitat for the conservation of Andean night monkeys in the northern Andes. *Agriculture, Ecosystems & Environment* 215:57–67.

- Haddad, F., L.A. Maffia, E.S.G. Mizubuti, and H. Teixeira. 2009. Biological control of coffee rust by antagonistic bacteria under field conditions in Brazil. *Biological Control* 49:114–119.
- Haddis, A., and R. Devi. 2008. Effect of effluent generated from coffee processing plant on the water bodies and human health in its vicinity. *Journal of Hazardous Materials* 152:259–262.
- Häger, A., M. Fernández Otárola, M.F. Stuhlmacher, R. Acuña Castillo, and A. Contreras Arias. 2015. Effects of management and landscape composition on the diversity and structure of tree species assemblages in coffee agroforests. *Agriculture, Ecosystems & Environment* 199:43–51.
- Häger, A. 2012. The effects of management and plant diversity on carbon storage in coffee agroforestry systems in Costa Rica. *Agroforestry Systems* 86:159–174.
- Haggar, J., M. Asigbaase, G. Bonilla, J. Pico, and A. Quilo. 2015. Tree diversity on sustainably certified and conventional coffee farms in Central America. *Biodiversity and Conservation* 24:1175–1194.
- Haggar, J., M. Barrios, M. Bolaños, M. Merlo, P. Moraga, R. Munguia, A. Ponce, S. Romero, G. Soto, C. Staver, and E. de M.F. Virginio. 2011. Coffee agroecosystem performance under full sun, shade, conventional and organic management regimes in Central America. *Agroforestry Systems* 82:285–301.
- Hairiah, K., H. Sulistyani, D. Suprayogo, Widiyanto, P. Purnomosidhi, R.H. Widodo, and M. Van Noordwijk. 2006. Litter layer residence time in forest and coffee agroforestry systems in Sumberjaya, West Lampung. *Forest Ecology and Management* 224:45–57.
- Hardt, E., E. Borgomeo, R.F. dos Santos, L.F.G. Pinto, J.P.P. Metzger, and G. Sparovek. 2015. Does certification improve biodiversity conservation in Brazilian coffee farms? *Forest Ecology and Management* 357:181 – 194.
- Hedstrom, I., A. Denzel, and G. Owens. 2006. Orchid bees as bio-indicators for organic coffee farms in Costa Rica: Does farm size affect their abundance? *Revista de Biologia Tropical* 54:965–969.
- Hedstrom, I., J. Harris, and K. Fergus. 2006. Euglossine bees as potential bio-indicators of coffee farms: Does forest access, on a seasonal basis, affect abundance? *Revista de Biologia Tropical* 54:1188–1195.
- Hein, L., and F. Gatzweiler. 2006. The economic value of coffee (*Coffea arabica*) genetic resources. *Ecological Economics* 60:176–185.
- Hergoualc'h, K., E. Blanchart, U. Skiba, C. Hénault, and J.-M. Harmand. 2012. Changes in carbon stock and greenhouse gas balance in a coffee (*Coffea arabica*) monoculture versus an agroforestry system with *Inga densiflora*, in Costa Rica. *Agriculture, Ecosystems & Environment* 148:102–110.
- Hernández Martínez, G., R.H. Manson, and A. Contreras Hernandez. 2009. Quantitative classification of coffee agroecosystems spanning a range of production intensities in central Veracruz, Mexico. *Agriculture, Ecosystems & Environment* 134:89–98.
- Hietz, P. 2005. Conservation of vascular epiphyte diversity in Mexican coffee plantations. *Conservation Biology* 19:391–399.
- Holwerda, F., L.A. Bruijnzeel, V.L. Barradas, and J. Cervantes. 2013. The water and energy exchange of a shaded coffee plantation in the lower montane cloud forest zone of central Veracruz, Mexico. *Agricultural and Forest Meteorology* 173:1–13.
- Hundera, K., R. Aerts, M.D. Beenhouwer, K. VanOvertveld, K. Helsen, B. Muys, and O. Honnay. 2013. Both forest fragmentation and coffee cultivation negatively affect epiphytic orchid diversity in Ethiopian moist evergreen Afromontane forests. *Biological Conservation* 159:285–291.
- Hylander, K., S. Nemomissa, J. Delrue, and W. Enkosa. 2013. Effects of coffee

- management on deforestation rates and forest integrity. *Conservation Biology* n/a–n/a.
- Hylander, K., and S. Nemomissa. 2008. Home garden coffee as a repository of epiphyte biodiversity in Ethiopia. *Frontiers in Ecology and the Environment* 6:524–528.
- Infante, F., A. Castillo, J. Pérez, and F.E. Vega. n.d. Field-cage evaluation of the parasitoid *Phymastichus coffea* as a natural enemy of the coffee berry borer, *Hypothenemus hampei*. *Biological Control*. Available online at <http://www.sciencedirect.com/science/article/pii/S1049964413002296>. Accessed October 11, 2013.
- Jackson, D., J. Skillman, and J. Vandermeer. 2012. Indirect biological control of the coffee leaf rust, *Hemileia vastatrix*, by the entomogenous fungus *Lecanicillium lecanii* in a complex coffee agroecosystem. *Biological Control* 61:89–97.
- Jacobs, R.M., and N.J. Yess. 1993. Survey of imported green coffee beans for pesticide residues. *Food Additives and Contaminants* 10:575–577.
- Jaramillo, J., A. Chabi-Olaye, C. Kamonjo, A. Jaramillo, F.E. Vega, H.-M. Poehling, and C. Borgemeister. 2009. Thermal tolerance of the coffee berry borer *Hypothenemus hampei*: predictions of climate change impact on a tropical insect pest. *PLoS ONE* 4:e6487.
- Jaramillo, J., E.G. Chapman, F.E. Vega, and J.D. Harwood. 2010. Molecular diagnosis of a previously unreported predator–prey association in coffee: *Karnyothrips flavipes* Jones (Thysanoptera: Phlaeothripidae) predation on the coffee berry borer. *Naturwissenschaften* 97:291–298.
- Jedlicka, J., R. Greenberg, I. Perfecto, S.M. Philpott, and T.V. Dietsch. 2006. Seasonal foraging niche shifts of tropical avian residents: resource competition at work? *Journal of Tropical Ecology* 22:385–395.
- De Jesús-Crespo, R., D. Newsom, E.G. King, and C. Pringle. 2016. Shade tree cover criteria for non-point source pollution control in the Rainforest Alliance coffee certification program: A snapshot assessment of Costa Rica's Tarrazú coffee region. *Ecological Indicators* 66:47–54.
- Jha, S., C.M. Bacon, S.M. Philpott, V.E. Méndez, P. Läderach, and R.A. Rice. 2014. Shade Coffee: Update on a Disappearing Refuge for Biodiversity. *BioScience* 64:416–428.
- Jha, S., C.M. Bacon, S.M. Philpott, R.A. Rice, V.E. Méndez, and P. Läderach. 2011. A review of ecosystem services, farmer livelihoods, and value chains in shade coffee agroecosystems. Pp. 141–208, *In* W.B. Campbell and S. Lopez Ortiz (Eds.). *Integrating Agriculture, Conservation and Ecotourism: Examples from the Field*. Springer Netherlands, Dordrecht. Available online at <http://www.springerlink.com/content/q653558t4q567h1m/>. Accessed January 10, 2012.
- Jha, S., and C.W. Dick. 2008. Shade coffee farms promote genetic diversity of native trees. *Current Biology* 18:R1126–R1128.
- Jha, S., and C.W. Dick. 2010. Native bees mediate long-distance pollen dispersal in a shade coffee landscape mosaic. *Proceedings of the National Academy of Sciences* 107:13760–13764.
- Jha, S., and J.H. Vandermeer. 2009. Contrasting bee foraging in response to resource scale and local habitat management. *Oikos* 118:1174–1180.
- Jha, S., and J.H. Vandermeer. 2010. Impacts of coffee agroforestry management on tropical bee communities. *Biological Conservation* 143:1423–1431.
- Jiménez-Soto, E., J.A. Cruz-Rodríguez, J. Vandermeer, and I. Perfecto. 2013. *Hypothenemus hampei* (Coleoptera: Curculionidae) and its Interactions with *Azteca instabilis* and *Pheidole synanthropica* (Hymenoptera: Formicidae) in a

- Shade Coffee Agroecosystem. *Environmental Entomology* 42:915–924.
- Jirinec, V., B.R. Campos, and M.D. Johnson. 2011. Roosting behaviour of a migratory songbird on Jamaican coffee farms: landscape composition may affect delivery of an ecosystem service. *Bird Conservation International FirstView*:1–9.
- Johnson, M., N. Levy, J. Kellermann, and D. Robinson. 2009. Effects of shade and bird exclusion on arthropods and leaf damage on coffee farms in Jamaica's Blue Mountains. *Agroforestry Systems* 76:139–148.
- Johnson, M.D., T.W. Sherry, R.T. Holmes, and P.P. Marra. 2006. Assessing habitat quality for a migratory songbird wintering in natural and agricultural habitats. *Conservation Biology* 20:1433–1444.
- Johnson, M.D. 2000. Effects of shade-tree species and crop structure on the winter arthropod and bird communities in a Jamaican shade coffee plantation. *Biotropica* 32:133–145.
- Joshi, A., D. Mudappa, and T. Raman. 2009. Brewing trouble: coffee invasion in relation to edges and forest structure in tropical rainforest fragments of the Western Ghats, India. *Biological Invasions* 11:2387–2400.
- Kairu, G.M., C.M.S. Nyangena, and J.E. Crosse. 1985. The effect of copper sprays on bacterial blight and coffee berry disease in Kenya. *Plant Pathology* 34:207–213.
- Kaiser, C.N., D.M. Hansen, and C.B. Muller. 2008. Exotic pest insects: another perspective on coffee and conservation. *Oryx* 42:143–146.
- Kapoor, V. 2008. Effects of rainforest fragmentation and shade-coffee plantations on spider communities in the Western Ghats, India. *Journal of Insect Conservation* 12:53–68.
- Karanja, R.H.N., G. Njoroge, M. Gikungu, and L.E. Newton. 2010. Bee interactions with wild flora around organic and conventional coffee farms in Kiambu district, central Kenya. *Journal of Pollination Ecology* 2:7–12.
- Kellermann, J.L., M.D. Johnson, A.M. Stercho, and S.C. Hackett. 2008. Ecological and economic services provided by birds on Jamaican Blue Mountain coffee farms. *Conservation Biology* 22:1177–1185.
- Kilian, B., C. Jones, L. Pratt, and A. Villalobos. 2006. Is sustainable agriculture a viable strategy to improve farm income in Central America? A case study on coffee. *Journal of Business Research* 59:322–330.
- Klein, A.M., I. Steffan-Dewenter, and T. Tscharntke. 2003. Bee pollination and fruit set of *Coffea arabica* and *C. canephora* (Rubiaceae). *American Journal of Botany* 90:153–157.
- Klein, A.M., I. Steffan-Dewenter, and T. Tscharntke. 2003. Fruit set of highland coffee increases with the diversity of pollinating bees. *Proceedings of the Royal Society B: Biological Sciences* 270:955–961.
- Klein, A.-M., I. Steffan-Dewenter, and T. Tscharntke. 2003. Pollination of *Coffea canephora* in relation to local and regional agroforestry management. *Journal of Applied Ecology* 40:837–845.
- Klein, A.-M. 2009. Nearby rainforest promotes coffee pollination by increasing spatio-temporal stability in bee species richness. *Forest Ecology and Management* 258:1838–1845.
- Kolk, A. 2005. Corporate social responsibility in the coffee sector: the dynamics of MNC responses and code development. *European Management Journal* 23:228–236.
- Komar, O. 2006. Ecology and conservation of birds in coffee plantations: a critical review. *Bird Conservation International* 16:1–23.
- Krishnan, S., C.G. Kushalappa, R.U. Shaanker, and J. Ghazoul. 2012. Status of pollinators and their efficiency in coffee fruit set in a fragmented landscape mosaic in South India. *Basic and Applied Ecology* 13:277–285.

- De La Mora, A., and S.M. Philpott. 2010. Wood-nesting ants and their parasites in forests and coffee agroecosystems. *Environmental Entomology* 39:1473–1481.
- Labouisse, J.-P., B. Bellachew, S. Kotecha, and B. Bertrand. 2008. Current status of coffee (*Coffea arabica* L.) genetic resources in Ethiopia: implications for conservation. *Genetic Resources and Crop Evolution* 55:1079–1093.
- Larsen, A., and S.M. Philpott. 2010. Twig-nesting ants: the hidden predators of the coffee berry borer in Chiapas, Mexico. *Biotropica* 42:342–347.
- Lepp, N., N. Dickinson, and K. Ormand. 1984. Distribution of fungicide-derived copper in soils, litter and vegetation of different aged stands of coffee (*Coffea arabica* L.) in Kenya. *Plant and Soil* 77:263–270.
- Lewin, B., D. Giovannucci, and P. Varangis. 2004. Coffee markets: new paradigms in global supply and demand. World Bank Agricultural and Rural Development Discussion Paper No. 3.
- Liliehalm, R.J., and W.P. Weatherly. 2010. Kibale forest wild coffee: challenges to market-based conservation in Africa. *Conservation Biology* 24:924–930.
- De Lima, R.F., L. Viegas, N. Solé, E. Soares, M. Dallimer, P.W. Atkinson, and J. Barlow. 2014. Can management improve the value of shade plantations for the endemic species of São Tomé Island? *Biotropica* 46:238–247.
- Lin, B.B. 2007. Agroforestry management as an adaptive strategy against potential microclimate extremes in coffee agriculture. *Agricultural and Forest Meteorology* 144:85–94.
- Lin, B.B. 2010. The role of agroforestry in reducing water loss through soil evaporation and crop transpiration in coffee agroecosystems. *Agricultural and Forest Meteorology* 150:510–518.
- Lindell, C., and M. Smith. 2003. Nesting bird species in sun coffee, pasture, and understory forest in southern Costa Rica. *Biodiversity and Conservation* 12:423–440.
- Lindell, C.A., R.S. O'Connor, and E.B. Cohen. 2011. Nesting success of Neotropical thrushes in coffee and pasture. *Wilson Journal of Ornithology* 123:502–507.
- Linton, A. 2005. Partnering for sustainability: Business–NGO alliances in the coffee industry. *Development in Practice* 15:600–614.
- Linton, A. 2008. A niche for sustainability? Fair labor and environmentally sound practices in the specialty coffee industry. *Globalizations* 5:231–245.
- Loland, J., and B.R. Singh. 2004. Copper contamination of soil and vegetation in coffee orchards after long-term use of Cu fungicides. *Nutrient Cycling in Agroecosystems* 69:203–211.
- Lomeli-Flores, J.R., J.F. Barrera, and J.S. Bernal. 2009. Impact of natural enemies on coffee leafminer *Leucoptera coffeella* (Lepidoptera: Lyonetiidae) population dynamics in Chiapas, Mexico. *Biological Control* 51:51–60.
- Lomelí-Flores, J.R., J.F. Barrera, and J.S. Bernal. 2010. Impacts of weather, shade cover and elevation on coffee leafminer *Leucoptera coffeella* (Lepidoptera: Lyonetiidae) population dynamics and natural enemies. *Crop Protection* 29:1039–1048.
- López-Bravo, D.F., E. de M. Virginio-Filho, and J. Avelino. 2012. Shade is conducive to coffee rust as compared to full sun exposure under standardized fruit load conditions. *Crop Protection* 38:21–29.
- López-Gómez, A.M., G. Williams-Linera, and R.H. Manson. 2008. Tree species diversity and vegetation structure in shade coffee farms in Veracruz, Mexico. *Agriculture, Ecosystems & Environment* 124:160–172.
- Lyngbæk, A.E., R.G. Muschler, and F.L. Sinclair. 2001. Productivity and profitability of multistrata organic versus conventional coffee farms in Costa Rica. *Agroforestry Systems* 53:205–213.

- Lyon, S. 2006. Migratory imaginations: The commodification and contradictions of shade grown coffee. *Social Anthropology* 14:377–390.
- Lyon, S. 2007. Maya coffee farmers and Fair Trade: assessing the benefits and limitations of alternative markets. *Culture & Agriculture* 29:100–112.
- M. van Oijen, J. Dauzat, J.-M.-M. Harmand, G. Lawson, and P. Vaast. 2010. Coffee agroforestry systems in Central America: II. Development of a simple process-based model and preliminary results. *Agroforestry Systems* 80:361–378.
- Magalhães, S.T.V., R.N.C. Guedes, E.R. Lima, and A.J. Demuner. 2008. Coffee leaf volatiles and egg laying by the coffee leaf miner *Leucoptera coffeella*. *Crop Protection* 27:1038–1041.
- Mahe, L., V.M.P. Varzea, D. Le Pierres, M.-C. Combes, and P. Lashermes. 2007. A new source of resistance against coffee leaf rust from New-Caledonian natural interspecific hybrids between *Coffea arabica* and *Coffea canephora*. *Plant Breeding* 126:638–641.
- Manrique, A.J., and R.E. Thimann. 2002. Coffee (*coffea arabica*) pollination with africanized honeybees in venezuela. *Interciencia* 27:414–416.
- Mansingh, G., H. Reichgelt, and K.-M. Bryson. 2007. CPEST: An expert system for the management of pests and diseases in the Jamaican coffee industry. *Expert Systems with Applications* 32:184–192.
- Marín, L., and I. Perfecto. 2013. Spider diversity in coffee agroecosystems: the influence of agricultural intensification and aggressive ants. *Environmental Entomology* 42:204–213.
- Marín, L., S.M. Philpott, A. De la Mora, G. Ibarra Núñez, S. Tryban, and I. Perfecto. 2016. Response of ground spiders to local and landscape factors in a Mexican coffee landscape. *Agriculture, Ecosystems & Environment* 222:80–92.
- Mariño, Y.A., M.-E. Pérez, F. Gallardo, M. Trifilio, M. Cruz, and P. Bayman. 2016. Sun vs. shade affects infestation, total population and sex ratio of the coffee berry borer (*Hypothenemus hampei*) in Puerto Rico. *Agriculture, Ecosystems & Environment* 222:258–266.
- Martínez-Verduzco, G.C., J.M. Galeana-Pizaña, and G.M. Cruz-Bello. 2012. Coupling community mapping and supervised classification to discriminate shade coffee from natural vegetation. *Applied Geography* 34:1–9.
- Mas, A.H., and T.V. Dietsch. 2003. An index of management intensity for coffee agroecosystems to evaluate butterfly species richness. *Ecological Applications* 13:1491–1501.
- Mas, A.H., and T.V. Dietsch. 2004. Linking shade coffee certification to biodiversity conservation: butterflies and birds in Chiapas, Mexico. *Ecological Applications* 14:642–654.
- McCook, S., and J. Vandermeer. 2015. The Big Rust and the Red Queen: Long-Term Perspectives on Coffee Rust Research. *Phytopathology* PHYTO-04-15-0085-RVW.
- McDermott, M.E., A.D. Rodewald, and S.N. Matthews. 2014. Managing tropical agroforestry for conservation of flocking migratory birds. *Agroforestry Systems* 89:383–396.
- McMurtry, J.J. 2009. Ethical value-added: Fair Trade and the case of Café Femenino. *Journal of Business Ethics* 86:27–49.
- Mendesil, E., and A. Tesfaye. 2009. The influence of weather on the seasonal incidence of coffee berry moth, *Prophantis smaragdina* (Butler). *Journal of Asia-Pacific Entomology* 12:203–205.
- Méndez, V., E. Shapiro, and G. Gilbert. 2009. Cooperative management and its effects on shade tree diversity, soil properties and ecosystem services of coffee plantations

- in western El Salvador. *Agroforestry Systems* 76:111–126.
- Méndez, V.E., C.M. Bacon, M. Olson, K.S. Morris, and A. Shattuck. 2010. Agrobiodiversity and shade coffee smallholder livelihoods: a review and synthesis of ten years of research in Central America. *The Professional Geographer* 62:357–376.
- Mendez, V.E., S.R. Gliessman, and G.S. Gilbert. 2007. Tree biodiversity in farmer cooperatives of a shade coffee landscape in western El Salvador. *Agriculture, Ecosystems & Environment* 1-2:145–159.
- Méndez-Castro, F., and D. Rao. 2014. Spider diversity in epiphytes: Can shade coffee plantations promote the conservation of cloud forest assemblages? *Biodiversity and Conservation* 23:2561–2577.
- Meylan, L., A. Merot, C. Gary, and B. Rapidel. 2013. Combining a typology and a conceptual model of cropping system to explore the diversity of relationships between ecosystem services: The case of erosion control in coffee-based agroforestry systems in Costa Rica. *Agricultural Systems* 118:52–64.
- Milder, J.C., M. Arbutnot, A. Blackman, S.E. Brooks, D. Giovannucci, L. Gross, E. Kennedy, K. Komives, E.F. Lambin, A. Lee, D. Meyer, P. Newton, B. Phalan, G. Schroth, B. Semroc, H.V. Rikxoort, and M. Zrust. 2015. An agenda for assessing and improving conservation impacts of sustainability standards in tropical agriculture. *Conservation Biology* 29:309–320.
- Millard, E. 2011. Incorporating agroforestry approaches into commodity value chains. *Environmental Management* 48:365–377.
- Milligan, M.C., M.D. Johnson, M. Garfinkel, C.J. Smith, and P. Njoroge. 2016. Quantifying pest control services by birds and ants in Kenyan coffee farms. *Biological Conservation* 194:58–65.
- Moguel, P., and V.M. Toledo. 1999. Biodiversity conservation in traditional coffee systems of Mexico. *Conservation Biology* 13:11–21.
- Mondego, J.M.C., O. Guerreiro-Filho, M.H. Bengtson, R. Drummond, J. de M. Felix, M.P. Duarte, D. Ramiro, M.P. Maluf, M.C. Sogayar, and M. Menossi. 2005. Isolation and characterization of *Coffea* genes induced during coffee leaf miner (*Leucoptera coffeella*) infestation. *Plant Science* 169:351–360.
- Monzón, A.J., F. Guharay, and I. Klingen. 2008. Natural occurrence of *Beauveria bassiana* in *Hypothenemus hampei* (Coleoptera: Curculionidae) populations in unsprayed coffee fields. *Journal of Invertebrate Pathology* 97:134–141.
- Moorhead, L.C., S.M. Philpott, and P. Bichier. 2010. Epiphyte biodiversity in the coffee agricultural matrix: canopy stratification and distance from forest fragments. *Conservation Biology* 24:737–746.
- Mora, A., and J. Beer. 2013. Geostatistical modeling of the spatial variability of coffee fine roots under *Erythrina* shade trees and contrasting soil management. *Agroforestry Systems* 87:365–376.
- De al Mora, A., G. Livingston, and S.M. Philpott. 2008. Arboreal ant abundance and leaf miner damage in coffee agroecosystems in Mexico. *Biotropica* 40:742–746.
- Mora, A.D. la, C.J. Murnen, and S.M. Philpott. 2013. Local and landscape drivers of biodiversity of four groups of ants in coffee landscapes. *Biodiversity and Conservation* 22:871–888.
- Mouen Bedimo, J.A., C. Cilas, J.L. Nottéghem, and D. Biéysse. 2012. Effect of temperatures and rainfall variations on the development of coffee berry disease caused by *Colletotrichum kahawae*. *Crop Protection* 31:125–131.
- Muleta, D., F. Assefa, S. Nemoissa, and U. Granhall. 2001. Composition of coffee shade tree species and density of indigenous arbuscular mycorrhizal fungi (AMF) spores in Bonga natural coffee forest, southwestern Ethiopia. *Forest Ecology and Management* 241:145–154.

- Mulinge, S.K. 1971. Effect of altitude on the distribution of the fungus causing coffee berry disease in Kenya. *Annals of Applied Biology* 67:93–98.
- Muriel, S.B., and G.H. Kattan. 2009. Effects of patch size and type of coffee matrix on Ithomiine butterfly diversity and dispersal in cloud-forest fragments. *Conservation Biology* 23:948–956.
- Murilo DaMatta, F. 2004. Exploring drought tolerance in coffee: a physiological approach with some insights for plant breeding. *Brazilian Journal of Plant Physiology* 16:1–6.
- Murrieta-Galindo, R., A. González-Romero, F. López-Barrera, and G. Parra-Olea. 2013. Coffee agrosystems: an important refuge for amphibians in central Veracruz, Mexico. *Agroforestry Systems* 87:767–779.
- Murthy, P.S., and M. Madhava Naidu. 2012. Sustainable management of coffee industry by-products and value addition—A review. *Resources, Conservation and Recycling* 66:45–58.
- Muschler, R. 2001. Shade improves coffee quality in a sub-optimal coffee-zone of Costa Rica. *Agroforestry Systems* 51:131–139.
- Mutersbaugh, T. 2004. Serve and certify: paradoxes of service work in organic-coffee certification. *Environment and Planning D: Society and Space* 22:533–552.
- Mwanthi, M., and V. Kimani. 1993. Agrochemicals pose health risks to coffee factory workers in Githuguri (Kenya). *International Journal of Environmental Health Research* 3:73–81.
- Mwanthi, M.A. 1998. Occurrence of three pesticides in community water supplies, Kenya. *Bulletin of Environmental Contamination and Toxicology* 60:601–608.
- Nath, C.D., R. Péliissier, B.R. Ramesh, and C. Garcia. 2011. Promoting native trees in shade coffee plantations of southern India: comparison of growth rates with the exotic *Grevillea robusta*. *Agroforestry Systems* 83:107–119.
- Neilson, J., and B. Pritchard. 2007. Green coffee? The contradictions of global sustainability initiatives from an Indian perspective. *Development Policy Review* 25:311–331.
- Neilson, J. 2008a. Environmental governance in the coffee forests of Kodagu, South India. *Transforming Cultures eJournal* 3. Available online at <http://epress.lib.uts.edu.au/journals/index.php/TfC/article/view/680>.
- Neilson, J. 2008b. Global private regulation and value-chain restructuring in Indonesian smallholder coffee systems. *World Development* 36:1607–1622.
- Nestel, D., F. Dickschen, and M.A. Altieri. 1993. Diversity patterns of soil macro-Coleoptera in Mexican shaded and unshaded coffee agroecosystems: an indication of habitat perturbation. *Biodiversity and Conservation* 2:70–78.
- Nestel, D., and F. Dickschen. 1990. The foraging kinetics of ground ant communities in different mexican coffee agroecosystems. *Oecologia* 84:58–63.
- Nestel, D. 1995. Coffee in Mexico: international market, agricultural landscape and ecology. *Ecological Economics* 15:165–178. *Ecological Economics*.
- Ninan, K.N., and J. Sathyapalan. 2005. The economics of biodiversity conservation: a study of a coffee growing region in the Western Ghats of India. *Ecological Economics* 55:61–72.
- Nir, M.A. n.d. The survivors: orchids on a Puerto Rican coffee finca. *American Orchid Society bulletin* v. 57(9) p. 989-995. Available online at <http://agris.fao.org/agris-search/search/display.do?f=1989/US/US89428.xml;US8843855>. Accessed January 18, 2012.
- Nonato de Souza, H., R.G.M. de Goede, L. Brussaard, I.M. Cardoso, E.M.G. Duarte, R.B.A. Fernandes, L.C. Gomes, and M.M. Pulleman. 2012. Protective shade, tree diversity and soil properties in coffee agroforestry systems in the Atlantic Rainforest biome. *Agriculture, Ecosystems & Environment* 146:179–196.

- Nonato de Souza, H., J. Graaff, and M.M. Pulleman. 2011. Strategies and economics of farming systems with coffee in the Atlantic Rainforest Biome. *Agroforestry Systems* 84:227–242.
- Noponen, M.R.A., J.P. Haggard, G. Edwards-Jones, and J.R. Healey. 2013. Intensification of coffee systems can increase the effectiveness of REDD mechanisms. *Agricultural Systems* 119:1–9.
- Noponen, M.R.A., J.R. Healey, G. Soto, and J.P. Haggard. 2013. Sink or source—The potential of coffee agroforestry systems to sequester atmospheric CO₂ into soil organic carbon. *Agriculture, Ecosystems & Environment* 175:60–68.
- Nyakaana, S. 2007. Microgeographical genetic structure of forest robusta coffee (*Coffea canephora*, Pierre), in Kibale National Park, Uganda. *African Journal of Ecology* 45:71–75.
- Nyambo, B.T., D.M. Masaba, and G.J. Hakiza. 1996. Integrated pest management of coffee for small-scale farmers in East Africa: needs and limitations. *Integrated Pest Management Reviews* 1:125–132.
- O'Brien, T.G., and M.F. Kinnaird. 2003. Caffeine and conservation. *Science* 300:587.
- Oduol, P.A., and J.R.W. Aluma. 1990. Banana (*Musa* spp.) — Coffee robusta: traditional agroforestry system of Uganda. *Agroforestry Systems* 11:213–226.
- Olschewski, R., T. Tschardtke, P.C. Benitez, S. Schwarze, and A. Klein. 2006. Economic evaluation of pollination services comparing coffee landscapes in Ecuador and Indonesia. *Ecology and Society* 11:[online] URL: <http://www.ecologyandsociety.org/vol11/iss1/art7/>.
- Olson, M.B., K.S. Morris, and V.E. Méndez. 2012. Cultivation of maize landraces by small-scale shade coffee farmers in western El Salvador. *Agricultural Systems* 111:63–74.
- Pak, D., A.L. Iverson, K.K. Ennis, D.J. Gonthier, and J.H. Vandermeer. 2015. Parasitoid wasps benefit from shade tree size and landscape complexity in Mexican coffee agroecosystems. *Agriculture, Ecosystems & Environment* 206:21–32.
- Payán, F., D. Jones, J. Beer, and J.-M. Harmand. 2009. Soil characteristics below *Erythrina poeppigiana* in organic and conventional Costa Rican coffee plantations. *Agroforestry Systems* 76:81–93.
- Peeters, L.Y., L. Soto-Pinto, H. Perales, G. Montoya, and M. Ishiki. 2003. Coffee production, timber, and firewood in traditional and Inga-shaded plantations in Southern Mexico. *Agriculture, Ecosystems and Environment* 95:481–493.
- Pereira, R.B., G.C. Lucas, F.J. Perina, and E. Alves. 2012. Essential oils for rust control on coffee plants. *Ciência e Agrotecnologia* 36:16–24.
- Perez-Lachaud, G., I.C.W. Hardy, and J.P. Lachaud. 2002. Insect gladiators: competitive interactions between three species of bethylid wasps attacking the coffee berry borer, *Hypothenemus hampei* (Coleoptera: Scolytidae). *Biological Control* 25:231–238.
- Perez-Lachaud, G., and I.C.W. Hardy. 2001. Alternative hosts for bethylid parasitoids of the coffee berry borer, *Hypothenemus hampei* (Coleoptera: Scolytidae). *Biological Control* 22:265–277.
- Perfecto, I., A. Mas, T. Dietsch, and J. Vandermeer. 2003. Conservation of biodiversity in coffee agroecosystems: a tri-taxa comparison in southern Mexico. *Biodiversity and Conservation* 12:1239–1252.
- Perfecto, I., and R. Snelling. 1995. Biodiversity and the transformation of a tropical agroecosystem: ants in coffee plantations. *Ecological Applications* 5:1084.
- Perfecto, I., J. Vandermeer, P. Hanson, and V. Cartin. 1997. Arthropod biodiversity loss and the transformation of a tropical agro-ecosystem. *Biodiversity and Conservation* 6:935–945.

- Perfecto, I., J. Vandermeer, G. Lopez Bautista, G. Ibarra Nunez, R. Greenberg, P. Bichier, and S. Langridge. 2004. Greater predation in shaded coffee farms: the role of resident Neotropical birds. *Ecology* 85:2677–2681.
- Perfecto, I., J. Vandermeer, A. Mas, and L. Soto-Pinto. 2005. Biodiversity, yield, and shade coffee certification. *Ecological Economics* 54:435–446.
- Perfecto, I., J. Vandermeer, and S.M. Philpott. 2014. Complex Ecological Interactions in the Coffee Agroecosystem. *Annual Review of Ecology, Evolution, and Systematics* 45:137–158.
- Perfecto, I., and J. Vandermeer. 1994. Understanding biodiversity loss in agroecosystems: reduction of ant diversity resulting from transformation of the coffee ecosystem in Costa Rica. *Entomology* 2:7–13.
- Perfecto, I., and J. Vandermeer. 1996. Microclimatic changes and the indirect loss of ant diversity in a tropical agroecosystem. *Oecologia* 108:577–582.
- Perfecto, I., and J. Vandermeer. 2002. Quality of agroecological matrix in a tropical montane landscape: ants in coffee plantations in southern Mexico. *Conservation Biology* 16:174–182.
- Perfecto, I., and J. Vandermeer. 2006. The effect of an ant-hemipteran mutualism on the coffee berry borer (*Hypothenemus hampei*) in southern Mexico. *Agriculture, Ecosystems and Environment* 117:218–221.
- Perfecto, I., and J. Vandermeer. 2008. Spatial pattern and ecological process in the coffee agroforestry system. *Ecology* 89:915–920.
- Perfecto, I., and J. Vandermeer. 2013. Ant assemblage on a coffee farm: spatial mosaic versus shifting patchwork. *Environmental Entomology* 42:38–48.
- Peters, V., and C. Carroll. 2012. Temporal variation in coffee flowering may influence the effects of bee species richness and abundance on coffee production. *Agroforestry Systems* 85:95–103.
- Petit, N. 2007. Ethiopia's coffee sector: A bitter or better future? *Journal of Agrarian Change* 7:225–263.
- Philpott, S., P. Bichier, R.A. Rice, and R. Greenberg. 2008. Biodiversity conservation, yield, and alternative products in coffee agroecosystems in Sumatra, Indonesia. *Biodiversity and Conservation* 17:1805–1820.
- Philpott, S.M., and I. Ambrecht. 2006. Biodiversity in tropical agroforests and the ecological role of ants and ant diversity in predatory function. *Ecological Entomology* 31:369–377.
- Philpott, S.M., W.J. Arendt, I. Ambrecht, P. Bichier, T.V. Dietsch, C. Gordon, R. Greenberg, I. Perfecto, R. Reynoso-Santos, L. Soto-Pinto, C. Tejada-Cruz, G. Williams-Linera, J. Valenzuela, and J.M. Zolotoff. 2008. Biodiversity loss in Latin American coffee landscapes: review of the evidence on ants, birds, and trees. *Conservation Biology* 22:1093–1105.
- Philpott, S.M., P. Bichier, R. Rice, and R. Greenberg. 2007. Field testing ecological and economic benefits of coffee certification programs. *Conservation Biology* 21:975–985.
- Philpott, S.M., and P.F. Foster. 2005. Nest-site limitation in coffee agroecosystems: artificial nests maintain diversity of arboreal ants. *Ecological Applications* 15:1478–1485.
- Philpott, S.M., J. Maldonado, J. Vandermeer, and I. Perfecto. 2004. Taking trophic cascades up a level: behaviorally modified effects of phorid flies on ants and ant prey in coffee agroecosystems. *Oikos* 105:141–147.
- Philpott, S.M., I. Perfecto, and J. Vandermeer. 2006. Effects of management intensity and season on arboreal ant diversity and abundance in coffee agroecosystems. *Biodiversity and Conservation* 15:139–155.

- Philpott, S.M., I. Perfecto, and J. Vandermeer. 2008. Behavioral diversity of predatory arboreal ants in coffee agroecosystems. *Environmental Entomology* 37:181–191.
- Philpott, S.M., I. Perfecto, and J. Vandermeer. 2008. Effects of predatory ants on lower trophic levels across a gradient of coffee management complexity. *Journal of Animal Ecology* 77:505–511.
- Philpott, S.M., S. Uno, and J. Maldonado. 2006. The importance of ants and high-shade management to coffee pollination and fruit weight in Chiapas, Mexico. *Biodiversity and Conservation* 15:487–501.
- Philpott, S.M. 2005a. Changes in arboreal ant populations following pruning of coffee shade-trees in Chiapas, Mexico. *Agroforestry Systems* 64:219–224.
- Philpott, S.M. 2005b. Trait-mediated effects of parasitic phorid flies (Diptera: Phoridae) on ant (Hymenoptera: Formicidae) competition and resource access in coffee agro-ecosystems. *Environmental Entomology* 34:1089–1094.
- Philpott, S.M. 2006. Ant patchiness: a spatially quantitative test in coffee agroecosystems. *Naturwissenschaften* 93:386–392.
- Philpott, S.M., R. Greenberg, P. Bichier, and I. Perfecto. 2004. Impacts of major predators on tropical agroforest arthropods: comparisons within and across taxa. *Oecologia* 140:140–149.
- Pinard, F., J.M. Boffa, and E. Rwakagara. 2014. Scattered shade trees improve low-input smallholder Arabica coffee productivity in the Northern Lake Kivu region of Rwanda. *Agroforestry Systems* 88:707–718.
- Pinard, F., E. Joetzier, R. Kindt, and K. Kehlenbeck. 2014. Are coffee agroforestry systems suitable for *in situ* conservation of indigenous trees? A case study from Central Kenya - Springer. *Biodiversity and Conservation* 23:467–495.
- Pineda, E., C. Moreno, F. Escobar, and G. Halffter. 2005. Frog, bat, and dung beetle diversity in the cloud forest and coffee agroecosystems of Veracruz, Mexico. *Conservation Biology* 19:400–410.
- Pinheiro, H.A., F.M. DaMatta, A.R.M. Chaves, M.E. Loureiro, and C. Ducatti. 2005. Drought tolerance is associated with rooting depth and stomatal control of water use in clones of *Coffea canephora*. *Annals of Botany* 96:101–108.
- Pinkus Rendón, M.A., G. Ibarra-Núñez, V. Parra-Tabla, J.A. García-Ballinas, and Y. Hénaut. 2006. Spider diversity in coffee plantations with different management in Southeast Mexico. *Journal of Arachnology* 34:104–112.
- Pomera, L.Y., R.J. Cooper, and L.J. Petit. 2003. Mixed-species flocking and foraging behavior of four neotropical warblers in Panamanian shade coffee fields and forests. *Auk* 120:1000–1012.
- Ponte, S. 2002. The “Latte Revolution”? Regulation, markets and consumption in the global coffee chain. *World Development* 30:1099–1122. World Development.
- Priess, J.A., M. Mimler, A.-M. Klein, S. Schwarze, T. Tschardt, and I. Steffan-Dewenter. 2007. Linking deforestation scenarios to pollination services and economic returns in coffee agroforestry systems. *Ecological Applications* 17:407–417.
- Railsback, S.F., and M.D. Johnson. 2011. Pattern-oriented modeling of bird foraging and pest control in coffee farms. *Ecological Modelling* 222:3305–3319.
- Rayner, R.W. 1962. Control of coffee rust in Kenya by fungicides. *Annals of Applied Biology* 50:245–261.
- Raynolds, L.T., D. Murray, and A. Heller. 2007. Regulating sustainability in the coffee sector: A comparative analysis of third-party environmental and social certification initiatives. *Agriculture and Human Values* 24:147–163.
- Renard, M.-C. 2010. In the name of conservation: CAFE Practices and Fair Trade in Mexico. *Journal of Business Ethics* 92:287–299.
- Rice, R. 2001. Noble goals and challenging terrain: organic and fair trade coffee

- movements in the global marketplace. *Journal of Agricultural and Environmental Ethics* 14:39–66.
- Rice, R.A. 2008. Agricultural intensification within agroforestry: The case of coffee and wood products. *Agriculture, Ecosystems & Environment* 128:212–218.
- Rice, R.A. 2011. Fruits from shade trees in coffee: how important are they? *Agroforestry Systems* 83:41–49.
- Richards, M.B., and V.E. Méndez. 2014. Interactions between carbon sequestration and shade tree diversity in a smallholder coffee cooperative in El Salvador. *Conservation Biology* 28:489–497.
- Richter, A., A.-M. Klein, T. Tschardt, and J. Tylianakis. 2007. Abandonment of coffee agroforests increases insect abundance and diversity. *Agroforestry Systems* 69:175–182.
- Ricketts, T.H., G.C. Daily, P.R. Ehrlich, and C.D. Michener. 2004. Economic value of tropical forest to coffee production. *Proceedings of the National Academy of Sciences* 101:12579–12582.
- Ricketts, T.H. 2004. Tropical forest fragments enhance pollinator activity in nearby coffee crops. *Conservation Biology* 18:1262–1271.
- Righi, C.A., O. Campoe, M.S. Bernardes, A.M. Lunz, S.M. Piedade, and C.R. Pereira. 2013. Influence of rubber trees on leaf-miner damage to coffee plants in an agroforestry system. *Agroforestry Systems* 87:1351–1362.
- Roberts, D.L., R.J. Cooper, and L.J. Petit. 2000a. Flock characteristics of ant-following birds in premontane moist forest and coffee agrosystems. *Ecological Applications* 10:1414–1425.
- Roberts, D.L., R.J. Cooper, and L.J. Petit. 2000b. Use of premontane moist forest and shade coffee agroecosystems by army ants in western Panama. *Conservation Biology* 14:192–199.
- Robinson, D.E., and A. Mansingh. 1999. Insecticide contamination of Jamaican environment. IV. Transport of residues from coffee plantations in the blue mountains to coastal waters in eastern Jamaica. *Environmental Monitoring and Assessment* 54:125–141.
- Rodríguez, D., J.R. Cure, J.M. Cotes, A.P. Gutierrez, and F. Cantor. 2011. A coffee agroecosystem model: I. Growth and development of the coffee plant. *Ecological Modelling* 222:3626–3639.
- Rodríguez, D., J.R. Cure, A.P. Gutierrez, J.M. Cotes, and F. Cantor. 2013. A coffee agroecosystem model: II. Dynamics of coffee berry borer. *Ecological Modelling* 248:203–214.
- Rojas, L., C. Godoy, P. Hanson, and L. Hilje. 2001. A survey of homopteran species (Auchenorrhyncha) from coffee shrubs and poró and laurel trees in shaded coffee plantations, in Turrialba, Costa Rica. *Revista de Biología Tropical* 49:1057–1065.
- Romanoff, S. 2010. Shade Coffee in Biological Corridors: Potential Results at the Landscape Level in El Salvador. *Culture & Agriculture* 32:27–41.
- Román-Ruiz, A.K., E.A. Malo, G. Huerta, A. Castillo, J.F. Barrera, and J.C. Rojas. 2012. Identification and origin of host-associated volatiles attractive to *Prorops nasuta*, a parasitoid of the coffee berry borer. *Arthropod-Plant Interactions* 6:611–620.
- Romero-Alvarado, Y., L. Soto-Pinto, L. García-Barrios, and J.F. Barrera-Gaytán. 2002. Coffee yields and soil nutrients under the shades of *Inga* sp. vs. multiple species in Chiapas, Mexico. *Agroforestry Systems* 54:215–224.
- Roobakkumar, A., S.D. Samuel, M.M. Balakrishnan, and K. Sreedharan. 2014. Release and Establishment of the Parasitoid *Cephalonomia stephanoderis* Betrem Against the Coffee Berry Borer *Hypothenemus hampei* Ferrari in Pulney Hills, Tamil Nadu, India. *Entomological News* 124:221–223.

- Roskoski, J.P. 1982. Nitrogen fixation in a Mexican coffee plantation. *Plant and Soil* 67:283–291.
- Rossmann, M., A.T. Matos, E.C. Abreu, F.F. Silva, and A.C. Borges. 2013. Effect of influent aeration on removal of organic matter from coffee processing wastewater in constructed wetlands. *Journal of Environmental Management* 128:912–919.
- Rueda, X., and E.F. Lambin. 2013. Responding to globalization: impacts of certification on Colombian small-scale coffee growers. *Ecology and Society* 18. Available online at <http://www.ecologyandsociety.org/vol18/iss3/art21/>. Accessed February 29, 2016.
- Rueda, X., N.E. Thomas, and E.F. Lambin. 2014. Eco-certification and coffee cultivation enhance tree cover and forest connectivity in the Colombian coffee landscapes. *Regional Environmental Change* 15:25–33.
- Russo, R.O., and G. Budowski. 1986. Effect of pollarding frequency on biomass of *Erythrina poeppigiana* as a coffee shade tree. *Agroforestry Systems* 4:145–162.
- Saldaña-Vázquez, R.A., V.J. Sosa, J.R. Hernández-Montero, and F. López-Barrera. 2010. Abundance responses of frugivorous bats (*Stenodermatinae*) to coffee cultivation and selective logging practices in mountainous central Veracruz, Mexico. *Biodiversity and Conservation* 19:2111–2124.
- Samnegård, U., P.A. Hambäck, S. Nemomissa, and K. Hylander. 2014. Local and regional variation in local frequency of multiple coffee pests across a mosaic landscape in *Coffea arabica*'s native range. *Biotropica* 46:276–284.
- Dos Santos, J.S., M.L.P. dos Santos, M.M. Conti, S.N. dos Santos, and E. de Oliveira. 2009. Evaluation of some metals in Brazilian coffees cultivated during the process of conversion from conventional to organic agriculture. *Food Chemistry* 115:1405–1410.
- Santos-Barrera, G., and N. Urbina-Cardona. 2011. The role of the matrix-edge dynamics of amphibian conservation in tropical montane fragmented landscapes. *Revista Mexicana de Biodiversidad* 8:679–687.
- Sarno, J. Lumbanraja, Afandi, T. Adachi, Y. Oki, M. Senge, and A. Watanabe. 2004. Effect of weed management in coffee plantation on soil chemical properties. *Nutrient Cycling in Agroecosystems* 69:1–4.
- Scheffknecht, S., M. Winkler, M. Mata-Rosas, and P. Hietz. 2012. Survival and growth of juvenile Bromeliads in coffee plantations and forests in central Veracruz, Mexico. *Biotropica* 44:341–349.
- Schmitt, C.B., F. Senbeta, M. Denich, H. Preisinger, and H.J. Boehmer. 2010. Wild coffee management and plant diversity in the montane rainforest of southwestern Ethiopia. *African Journal of Ecology* 48:78–86.
- Schmitt-Harsh, M., T. Evans, E. Castellanos, and J. Randolph. 2012. Carbon stocks in coffee agroforests and mixed dry tropical forests in the western highlands of Guatemala. *Agroforestry Systems* 86:141–157.
- Schmitt-Harsh, M. 2013. Landscape change in Guatemala: Driving forces of forest and coffee agroforest expansion and contraction from 1990 to 2010. *Applied Geography* 40:40–50.
- Schroth, G., P. Laderach, J. Dempewolf, S. Philpott, J. Haggard, H. Eakin, T. Castillejos, J. Garcia Moreno, L. Soto Pinto, R. Hernandez, A. Eitzinger, and J. Ramirez-Villegas. 2009. Towards a climate change adaptation strategy for coffee communities and ecosystems in the Sierra Madre de Chiapas, Mexico. *Mitigation and Adaptation Strategies for Global Change* 14:605–625.
- Segura, H.R., J.F. Barrera, H. Morales, and A. Nazar. 2004. Farmers' Perceptions, Knowledge, and Management of Coffee Pests and Diseases and Their Natural Enemies in Chiapas, Mexico. *Journal of Economic Entomology* 97:1491–1499.
- Senbeta, F., and M. Denich. 2006. Effects of wild coffee management on species diversity

- in the Afromontane rainforests of Ethiopia. *Forest Ecology and Management* 232:68–74.
- Serkercioglu, C.H., S.R. Loarie, F. Oviendo Brenes, P.R. Erlich, and G.C. Daily. 2007. Persistence of forest birds in the Costa Rican agricultural countryside. *Conservation Biology* 21:482–494.
- Setotaw, T.A., E.T. Caixeta, A.A. Pereira, A.C. Baião de Oliveira, C.D. Cruz, E.M. Zambolim, L. Zambolim, and N.S. Sakiyama. 2013. Coefficient of Parentage in L. Cultivars Grown in Brazil. *Crop Science* 53:1237.
- Shankar Raman, T.R. 2006. Effects of habitat structure and adjacent habitats on birds in tropical rainforest fragments and shaded plantations in the Western Ghats, India. *Biodiversity and Conservation* 15:1577–1607.
- Sherry, T. 2000. Shade coffee: a good brew even in small doses. *Auk* 117:563–568.
- Siles, P., J.-M. Harmand, and P. Vaast. 2009. Effects of *Inga densiflora* on the microclimate of coffee (*Coffea arabica* L.) and overall biomass under optimal growing conditions in Costa Rica. *Agroforestry Systems* 78:269–286.
- Silva, W., G. Mascarin, E. Romagnoli, and J. Bento. 2012. Mating Behavior of the Coffee Berry (*Hypothenemus hampei*) (Ferrari) (Coleoptera: Curculionidae: Scolytinae). *Journal of Insect Behavior* 25:408–417.
- Silvarolla, M.B., P. Mazzafera, and L.C. Fazuoli. 2004. Plant biochemistry: A naturally decaffeinated arabica coffee. *Nature* 429:826.
- Siu, Y., G. Mejia, J. Mejia-Saavedra, J. Pohlan, and M. Sokolov. 2007. Heavy metals in wet method coffee processing wastewater in Soconusco, Chiapas, Mexico. *Bulletin of Environmental Contamination and Toxicology* 78:400–404.
- Smith, J. 2007. The search for sustainable markets: The promise and failures of Fair Trade. *Culture & Agriculture* 29:89–99.
- Solis-Montero, L., A. Flores-Palacios, and A. Cruz-Angon. 2005. Shade-coffee plantations as refuges for tropical wild orchids in central Veracruz, Mexico. *Conservation Biology* 19:908–916.
- Somarriba, E. 1990. Sustainable timber production from uneven-aged shade stands of *Cordia alliodora* in small coffee farms. *Agroforestry Systems* 10:253–263.
- Soto-Pinto, L., M. Anzueto, J. Mendoza, G. Ferrer, and B. de Jong. 2010. Carbon sequestration through agroforestry in indigenous communities of Chiapas, Mexico. *Agroforestry Systems* 78:39–51.
- Soto-Pinto, L., I. Perfecto, and J. Caballero-Nieto. 2002. Shade over coffee: its effects on berry borer, leaf rust and spontaneous herbs in Chiapas, Mexico. *Agroforestry Systems* 55:37–45.
- Soto-Pinto, L., I. Perfecto, J. Castillo-Hernandez, and J. Caballero-Nieto. 2000. Shade effect on coffee production at the northern Tzeltal zone of the state of Chiapas, Mexico. *Agriculture, Ecosystems & Environment* 80:61–69.
- Soto-Pinto, L., Y. Romero-Alvarado, J. Caballero-Nieto, and G. Segura Warnholtz. 2001. Woody plant diversity and structure of shade-grown-coffee plantations in Northern Chiapas, Mexico. *Revista de Biología Tropical* 49:977–987.
- Soto-Pinto, L., V. Villalavazo-Lopez, G. Jimenez-Ferrer, N. Ramirez-Marcial, G. Montoya, and F.L. Sinclair. 2007. The role of local knowledge in determining shade composition of multistrata coffee systems in Chiapas, Mexico. *Bi* 16:419–436.
- Souza, H.N., I.M. Cardoso, J.M. Fernandes, F.C.P. Garcia, V.R. Bonfim, A.C. Santos, A.F. Carvalho, and E.S. Mendonça. 2010. Selection of native trees for intercropping with coffee in the Atlantic Rainforest biome. *Agroforestry Systems* 80:1–16.
- Staver, C., F. Guharay, D. Monterroso, and R. Muschler. 2001. Designing pest-suppressive multistrata perennial crop systems: shade-grown coffee in Central America. *Agroforestry Systems* 53:151–170.

- Steiman, S., T. Idol, H.C. Bittenbender, and L. Gautz. 2011. Shade coffee in Hawai'i - Exploring some aspects of quality, growth, yield, and nutrition. *Scientia Horticulturae* 128:152–158.
- Tadesse, G., E. Zavaleta, C. Shennan, and M. FitzSimmons. 2014. Prospects for forest-based ecosystem services in forest-coffee mosaics as forest loss continues in southwestern Ethiopia. *Applied Geography* 50:144–151.
- Tadesse, G., E. Zavaleta, and C. Shennan. 2014. Coffee landscapes as refugia for native woody biodiversity as forest loss continues in southwest Ethiopia. *Biological Conservation* 169:384–391.
- Takahashi, R., and Y. Todo. 2013. The impact of a shade coffee certification program on forest conservation: A case study from a wild coffee forest in Ethiopia. *Journal of Environmental Management* 130:48–54.
- Takahashi, R., and Y. Todo. 2014. The impact of a shade coffee certification program on forest conservation using remote sensing and household data. *Environmental Impact Assessment Review* 44:76–81.
- Talbot, J.M. 1997. Where does your coffee dollar go?: The division of income and surplus along the coffee commodity chain. *Studies in Comparative International Development (SCID)* 32:56–91.
- Taylor, D.A. 2007. Certified coffee: Does the premium pay off? *Environmental Health Perspectives* 115:A456–A459.
- Tejeda-Cruz, C., and W.J. Sutherland. 2004. Bird responses to shade coffee production. *Animal Conservation* 7:169–179.
- Teklay, T., and A. Malmer. 2004. Decomposition of leaves from two indigenous trees of contrasting qualities under shaded-coffee and agricultural land-uses during the dry season at Wondo Genet, Ethiopia. *Soil Biology and Biochemistry* 36:777–786.
- Teodoro, A., A.-M. Klein, and T. Tscharntke. 2008. Environmentally mediated coffee pest densities in relation to agroforestry management, using hierarchical partitioning analyses. *Agriculture, Ecosystems & Environment* 125:120–126.
- Teodoro, A.V., A.-M. Klein, and T. Tscharntke. 2009. Temporally mediated responses of the diversity of coffee mites to agroforestry management. *Journal of Applied Entomology* 133:659–665.
- Teodoro, A.V., L. Sousa-Souto, A.-M. Klein, and T. Tscharntke. 2010. Seasonal contrasts in the response of coffee ants to agroforestry shade-tree management. *Environmental Entomology* 39:1744–1750.
- Teodoro, A.V., T. Tscharntke, and A.-M. Klein. 2009. From the laboratory to the field: contrasting effects of multi-trophic interactions and agroforestry management on coffee pest densities. *Entomologia Experimentalis et Applicata* 131:121–129.
- Thanh Ha, D., and G. Shively. 2008. Coffee boom, coffee bust and smallholder response in Vietnam's Central Highlands. *Review of Development Economics* 12:312–326.
- Toledo-Aceves, T., K. Mehlreter, J.G. García-Franco, A. Hernández-Rojas, and V.J. Sosa. 2013. Benefits and costs of epiphyte management in shade coffee plantations. *Agriculture, Ecosystems & Environment* 181:149–156.
- Tribble, W., and R. Carroll. 2014. Manipulating tropical fire ants to reduce the coffee berry borer. *Ecological Entomology* 39:603–609.
- Tscharntke, T., Y. Clough, S.A. Bhagwat, D. Buchori, H. Faust, D. Hertel, D. Hölscher, J. Juhrbandt, M. Kessler, I. Perfecto, C. Scherber, G. Schroth, E. Veldkamp, and T.C. Wanger. 2011. Multifunctional shade tree management in tropical agroforestry landscapes – a review. *Journal of Applied Ecology* 48:619–629.
- Tscharntke, T., J.C. Milder, G. Schroth, Y. Clough, F. DeClerck, A. Waldron, R. Rice, and J. Ghazoul. 2015. Conserving Biodiversity Through Certification of Tropical Agroforestry Crops at Local and Landscape Scales. *Conservation Letters* 8:14–23.

- Tucker, C.M., H. Eakin, and E.J. Castellanos. 2010. Perceptions of risk and adaptation: Coffee producers, market shocks, and extreme weather in Central America and Mexico. *Global Environmental Change* 20:23–32.
- Tuelher, E.S., M. Venzon, R.N.C. Guedes, and A. Pallini. 2014. Toxicity of organic-coffee-approved products to the southern red mite *Oligonychus ilicis* and to its predator *Iphiseiodes zuluagai*. *Crop Protection* 55:28–34.
- Tully, K.L., D. Lawrence, and T.M. Scanlon. 2012. More trees less loss: Nitrogen leaching losses decrease with increasing biomass in coffee agroforests. *Agriculture, Ecosystems & Environment* 161:137–144.
- Urrutia-Escobar, M.X., and I. Armbrrecht. 2013. Effect of two agroecological management strategies on ant (Hymenoptera: Formicidae) diversity on coffee plantations in southwestern Colombia. *Environmental Entomology* 42:194–203.
- Vaast, P., B. Bertrand, J.-J.-J. Perriot, B. Guyot, and M. Génard. 2006. Fruit thinning and shade improve bean characteristics and beverage quality of coffee (*Coffea arabica* L.) under optimal conditions. *Journal of the Science of Food and Agriculture* 86:197–204.
- Valencia, V., L. García-Barrios, P. West, E.J. Sterling, and S. Naeem. 2014. The role of coffee agroforestry in the conservation of tree diversity and community composition of native forests in a Biosphere Reserve. *Agriculture, Ecosystems & Environment* 189:154–163.
- Valencia, V., S. Naeem, L. García-Barrios, P. West, and E.J. Sterling. 2016. Conservation of tree species of late succession and conservation concern in coffee agroforestry systems. *Agriculture, Ecosystems & Environment* 219:32–41.
- Valencia, V., P. West, E.J. Sterling, L. García-Barrios, and S. Naeem. 2015. The use of farmers' knowledge in coffee agroforestry management: implications for the conservation of tree biodiversity. *Ecosphere* 6:1–17.
- Valkila, J., and A. Nygren. 2009. Impacts of Fair Trade certification on coffee farmers, cooperatives, and laborers in Nicaragua. *Agriculture and Human Values* 27:321–333.
- Valkila, J. 2009. Fair Trade organic coffee production in Nicaragua — Sustainable development or a poverty trap? *Ecological Economics* 68:3018–3025.
- VanAmstel, M., C. de Brauw, P. Driessen, and P. Glasbergen. 2007. Reliability of product-specific eco-labels as an agrobiodiversity management instrument. *Biodiversity and Conservation* 16:4109–4129.
- Vandermeer, J., I. Perfecto, G. Ibarra Nunez, S. Philpott, and A. García-Ballinas. 2002. Ants (*Azteca* sp.) as potential biological control agents in shade coffee production in Chiapas, Mexico. *Agroforestry Systems* 56:271–276.
- Vandermeer, J., I. Perfecto, and H. Liere. 2009. Evidence for hyperparasitism of coffee rust (*Hemileia vastatrix*) by the entomogenous fungus, *Lecanicillium lecanii*, through a complex ecological web. *Plant Pathology* 58:636–641.
- Vannini, J.P. 1994. Nearctic avian migrants in coffee plantations and forest fragments of south-western Guatemala. *Bird Conservation International* 4:209–232.
- Varon, E.H., S.D. Eigenbrode, N.A. Bosque-Perez, and L. Hilje. 2007. Effect of farm diversity on harvesting of coffee leaves by the leaf-cutting ant *Atta cephalotes*. *Agricultural and Forest Entomology* 9:47–55.
- Veddeler, D., A.-M. Klein, and T. Tschardtke. 2006. Contrasting responses of bee communities to coffee flowering at different spatial scales. *Oikos* 112:594–601.
- Veddeler, D., R. Olschewski, T. Tschardtke, and A.-M. Klein. 2008. Contribution of non-managed social bees to coffee production: new economic insights based on farm-scale yield data. *Agroforestry Systems* 73:109–114.
- Vega, F.E., R.A. Franqui, and P. Benavides. 2002. The presence of the coffee berry borer,

- Hypothenemus hampei, in Puerto Rico: fact or fiction? *Journal of Insect Science* 2:1–3.
- Verbist, B., A.E.D. Putra, and S. Budidarsono. 2005. Factors driving land use change: Effects on watershed functions in a coffee agroforestry system in Lampung, Sumatra. *Agricultural Systems* 85:254–270.
- Verchot, L.V., L. Hutabarat, K. Hairiah, and M. Van Noordwijk. 2006. Nitrogen availability and soil N₂O emissions following conversion of forests to coffee in southern Sumatra. *Global Biogeochemical Cycles* 20:GB4008.1–GB4008.12.
- Vergara, C.H., and E.I. Badano. 2009. Pollinator diversity increases fruit production in Mexican coffee plantations: The importance of rustic management systems. *Agriculture, Ecosystems & Environment* 129:117–123.
- Vine, B.H., P.A. Vine, and E. Griffiths. 1973a. Evaluation of fungicides for the control of coffee berry disease in Kenya. *Annals of Applied Biology* 75:359–375.
- Vine, B.H., P.A. Vine, and E. Griffiths. 1973b. Some problems of evaluating fungicides for use on coffee in Kenya. *Annals of Applied Biology* 75:377–385.
- Weber, J.G. 2011. How much more do growers receive for Fair Trade-organic coffee? *Food Policy* 36:678–685.
- Wiersum, K.F., T.W. Gole, F. Gatzweiler, J. Volkmann, E. Bognetteau, and O. Wirtu. 2008. Certification of wild coffee in Ethiopia: experiences and challenges. *Forests, Trees, and Livelihoods* 18:9–22.
- Williams-Guillé, K., C. McCann, Martínez Sanchez, and F. Koontz. 2006. Resource availability and habitat use by mantled howling monkeys in a Nicaraguan coffee plantation: can agroforests serve as core habitat for a forest mammal? *Animal Conservation* 9:331–338.
- Willmer, P.G., and G.N. Stone. 1989. Incidence of entomophilous pollination of lowland coffee (*Coffea canephora*); the role of leaf cutter bees in Papua New Guinea. *Entomologia Experimentalis et Applicata* 50:113–124.
- Winkels, A. 2008. Rural in-migration and global trade. *Mountain Research and Development* 28:32–40.
- Wollni, M., and B. Brümmer. 2012. Productive efficiency of specialty and conventional coffee farmers in Costa Rica: Accounting for technological heterogeneity and self-selection. *Food Policy* 37:67–76.
- Wollni, M., and M. Zeller. 2007. Do farmers benefit from participating in specialty markets and cooperatives? The case of coffee marketing in Costa Rica 1. *Agricultural Economics* 37:243–248.
- Wunderle, J.M.J., and S.C. Latta. 1996. Avian abundance in sun and shade coffee plantations and remnant pine forest in the Cordillera Central, Dominican Republic. *Ornitologia Neotropical* 7:19–34.
- Wunderle, J.M.J., and S.C. Latta. 1998. Avian resource use in Dominican shade coffee plantations. *Wilson Bulletin* 110:271–281.
- Wunderle, J.M.J., and S.C. Latta. 2000. Winter site fidelity of Nearctic migrants in shade coffee plantations of different sizes in the Dominican Republic. *Auk* 117:596–614.
- Wunderle, J.M.J. 1999. Avian distribution in Dominican shade coffee plantations: Area and habitat relationships. *Journal of Field Ornithology* 70:58–70.
- Wyk, M., B.D. Wingfield, M. Marin, and M.J. Wingfield. 2010. New *Ceratocystis* species infecting coffee, cacao, citrus and native trees in Colombia. *Fungal Diversity* 40:103–117.
- Young, C. 2003. Coffee agroforestry systems for conservation and economic development -- A case study of the AMISCONDE initiative in a buffer zone community of Costa Rica. *Journal of Sustainable Forestry* 16:39.