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Global Warming and the New Geography of Brazilian Coffee Production

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Abstract

Coffee culture in Brazil is characterised by plant species Arabica (*Coffea arabica* L.), prevalent in areas with mean annual temperatures between 18°C and 22°C and plants species Robusta (*Coffea canephora* Pierre) grown in areas with annual mean temperatures between 22°C and 26°C. Temperatures outside these limits, normally caused by heat waves, cause damage to the coffee crop due to floral abortion — temperature equal or higher than 33°C - or tissue death due to frost, when leaf temperature reaches $^{-3}$.5°C or 1.5°C in the meteorological shelter. The total rainfall varies from 1200 to 1400 millimeters with a dry interval in the winter, when the harvester occurs. A dry period of four or five month with water deficiency before flowering is favourably to better quality beans.

According to the five reports of the Intergovernmental Panel of Climatic Change (1990, 1995, 2001, 2007 and 2014) in the near future the global mean temperature is supposed to increase at least 2°C in the actual Brazilian cultivated areas and the total rainfall can increase about 15 % in the tropical area. Using the IPCC parameters, a new geography of coffee plantation in Brazil was simulated for the years 2030 and 2050, based on eco-physiological behaviour of plants and climatic adaptability of both species of coffee to new climate conditions that may prevail in the country, especially in the Southeast and South regions. The results showed a migration of coffee Arabica from Southeast to South of the country and a possibility of Robusta coffee cultivation in the Southeast. Nevertheless, to the year 2020 Brazil can lose about 10 % of the potential area for Arabica coffee.

Keywords: Arabica coffee, climate and coffee, coffee, coffee and global warming, coffee in Brazil, Conilon coffee

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