

Potential for growing Arabica coffee in the extreme south of Brazil in a warmer world

Jurandir Zullo Jr. · Hilton Silveira Pinto · Eduardo Delgado Assad ·
Ana Maria Heuminski de Ávila

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Abstract Agriculture appears to be one of the human activities most vulnerable to climatic changes due to its large dependence on environmental conditions. However, the diversity of Brazilian environmental conditions could be of great advantage to adapting this sector to new climatic conditions, which should be assessed as in this study on shifting Arabica coffee cultivation to the extreme south of the country. The methodology applied is the same the one used to define climatic risks in current productive regions of Brazil and their vulnerability to climatic change predicted by IPCC reports. The basic climatic parameters applied were frost probability and annual average temperature, since annual water deficit did not prove to be a restricting factor for Arabica coffee cultivation in the study area. The climatic conditions suitable for coffee production are: annual average temperature between 18°C and 22°C, annual water deficit less than 100 mm and frost probability (risk of lowest annual temperature less than 1°C) less than 25%. An area is said to have “low climatic risks” for coffee production when these three climatic conditions are met. Current climatic conditions were used and simulations of four temperature increases between 1°C and 4°C were also performed. The results indicated a substantial increase in the size of low climatic risks areas for the production of Arabica coffee in the extreme south of Brazil, mainly for mean temperature increases of 3°C in

J. Zullo Jr. (✉) · H. S. Pinto · A. M. H. de Ávila
Cepagri, Unicamp, Cidade Universitária Zeferino Vaz, 13083970, Campinas, SP, Brazil
e-mail: jurandir@cpa.unicamp.br

H. S. Pinto
e-mail: hilton@cpa.unicamp.br

A. M. H. de Ávila
e-mail: avila@cpa.unicamp.br

E. D. Assad
Informática Agropecuária, Embrapa,
Av. André Tosello, 209, 13083886, Campinas, SP, Brazil
e-mail: assad@cnptia.embrapa.br