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Determinants of Agricultural Technology Adoption under Incomplete Population-Exposure in Eastern and Southern Africa: The Case of Pigeoepa in Malawi

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Abstract

There is little disagreement regarding the benefits of improved agricultural technology among the poor. In Eastern and Southern Africa, dryland legumes offer enormous opportunities for income growth and poverty reduction. Consequently, a number of improved cultivars of high value legumes such as pigeonpea have been released and are being disseminated to increase productivity. ICRISAT has released a number of improved cultivars of pigeonpea which include two of long duration type (ICP 9145 and ICEAP 00040) and two of short duration type (ICPL 93027 and ICPL 87105). Some years after they were released, it is important to assess the extent to which they have been adopted by farmers.

A limited number of studies that have attempted to assess their adoption rates and determinants do not adequately control for technology exposure as well as population selection biases. This paper uses the Average Treatment Effect (ATE) estimation framework that corrects for both forms of bias to document the actual and potential adoption rates of improved pigeonpea varieties and their determinants using data from a sample of 594 farmers in Malawi. The study is based on a household survey data collected by the International Crops Research Institute for the semi-Arid Tropics (ICRISAT). The results indicate that only 26 % of the sample households were exposed to improved pigeonpea varieties (ICEAP00040 and ICP 9145) in 2007. Furthermore, about 10 % of the sampled farmers grew at least one of the improved pigeonpea varieties. The potential adoption rate of improved pigeonpea for the population is estimated at 41 % with the adoption gap (difference between the 41 % potential adoption rate and the 10 % actual adoption rate) resulting from the incomplete exposure of the population to the pigeon peas at 31 %. Furthermore, results indicate that farmers with access to credit have a higher propensity to adopt pigeonpea than those without credit access. The findings suggest that there is scope for increasing the adoption rate of improved pigeonpea varieties once the farmers have access to the seed, which also indicates a relatively large unmet demand for improved pigeonpea varieties in the study areas.

Keywords: Adoption, agricultural technology, average treatment effect, Malawi, pigeonpea