

Identifying and Addressing Barriers to Low Adoption of Agricultural Inputs in Burkina Faso



Despite the availability of new agricultural technologies, which may increase yields and household income, few farmers in the Sahel region of Sub-Saharan Africa are using improved seeds and fertilizer. This study in Burkina Faso tested different ways of organizing the market for inputs and examined how adoption of a fertilizer application technique called microdosing spreads from farmer to farmer. Preliminary results suggest that subsidies alone were not effective in increasing take-up, but that a soft commitment—where people committed to buying inputs at the time when they had cash in hand—significantly increased adoption of inputs, at no additional cost to providers. Results also suggest that targeting based on social network characteristics affects patterns of diffusion, particularly in cases where women are excluded from social networks. Impacts on productivity are still forthcoming.

Policy Issue

Agricultural output has accelerated in Sub-Saharan Africa the last two decades, but agricultural productivity in the region remains low, especially compared to other regions of the world.¹ Greater use of inorganic fertilizer and improved seeds have the potential to help African farmers boost production and farm profitably, but adoption of these technologies has been slow in the region.² The barriers to adoption may be on the “supply-side,” meaning the price, availability, or information about the inputs may be lacking. Or the barriers may be on the “demand-side;” farmers may not want to buy these inputs because they lack credit, labor, sufficient land, or knowledge of new technologies, among other possibilities.

Previous [research](#) has shown that the timing of offers for purchasing inputs has a large effect on demand and that timing offers after the harvest, when farmers have cash, can be more effective at increasing adoption than agricultural subsidies. This research builds on these findings in the West African context by identifying how commitment contracts can be best designed to encourage adoption. It also investigates if people are more likely to adopt the technology if they receive it free of charge and how knowledge passes from farmer to farmer via social networks. Given that altering timing and offering commitments are relatively costless, this research may have



RESEARCHERS

Andrew Dillon, Melinda Smale, Aissatou Ouedraogo, Maria Porter

COUNTRY

Burkina Faso

PARTNERS

Association of Wholesalers and Retailers of Agricultural Inputs (AGRODIA), Environmental Institute for Agricultural Research - Burkina Faso (INERA)

PROGRAM AREA

Agriculture

TOPICS

Livelihoods, Technology Adoption

TIMELINE

2014-2017

important implications for agricultural policy in resource-constrained contexts.

Evaluation Context

Sorghum is the main food staple and most widely cultivated dryland crop among rural people of the West African Sahel. Despite the potential to attain over two tons per hectare with improved varieties, average sorghum yields in Burkina Faso are estimated at less than half that much. In addition, adoption of sorghum agricultural technology is far less than it is for rice, maize or specialty crops.

This study was conducted in partnership with AGRODIA, an agricultural non-profit based in Burkina Faso, and INERA, the Environmental Institute for Agricultural Research in Burkina Faso.

Details of the Intervention

Innovations for Poverty Action worked with researchers to measure the impacts on take-up and productivity of fertilizer microdosing (a fertilization and planting technique of applying small amounts of fertilizer at the roots of the plant at the moment of planting), as well as to investigate the reasons for low adoption of these inputs, examine if different forms of commitment increase take-up, and measure if and how adoption spreads from farmer to farmer through social networks.

To investigate these topics, researchers randomly assigned 165 villages in northern Burkina Faso to one of the following seven groups.

- 1) **Free distribution (random):** A group of randomly selected farming households received a microdosing training and kit of seeds and fertilizer for free equivalent to a half hectare of inputs. This group served as a comparison group to groups two and three. *(15 households in 80 villages)*
- 2) **Free distribution (social network - connection):** A group of farming households, selected based on the number of other farmers to which the farmers were *connected*, received the microdosing training and input kits for free. *(15 households in 16 villages)*
- 3) **Free distribution (social network - influence):** A group of farming households, selected based on their to which a farmer *influenced* other farmers, received the microdosing training and kits for free. *(15 households in 16 villages)*
- 4) **Early commitment:** Farming households were offered a microdosing training and the input packet at the market price after the harvest in February, and received the inputs at planting time in June. Five percent had to be paid upfront. *(all households, 12 villages)*
- 5) **Late commitment market price:** Farming households were offered a microdosing training and the input packet at the market price right before planting season in June/July. Payments had to be made upfront. *(all households, 12 villages)*
- 6) **Late commitment subsidy:** Farming households were offered a microdosing training and the input packet in June/July with a 20 percent subsidy on the market price of fertilizer. Payments had to be made upfront. *(all households, 12 villages)*

7) **Comparison group:** This group was not offered any of the above at the time of the study. (20 villages)

Results and Policy Lessons

Preliminary Results

Input market organization: Take-up rates of the offers varied substantially. Among those offered the late commitment at market price, only 5 percent bought the kits. Among those offered the late commitment with the subsidy, just 6 percent bought the kits. The participation rate in the early commitment group were substantially higher: 18 percent bought the kits. More specifically, 150 kits were paid for in June out of 450 ordered in February—a 34 percent “top-up” rate. These results are consistent with other related research findings in other non-agricultural contexts, showing that less stringent commitments may be more effective. Less stringent commitment mechanisms provide farmers more liquidity to manage risk, but commits them to using improved inputs.

Social network effects: One year after the training and inputs were provided, take-up at the village level was higher (11 percent of farm households) in villages where there was random distribution, relative to targeting strategies that relied on network influence (9 percent of farm households), or the number of connections the farmer had (7 percent of farm households). However, it is too early to conclude how and to what extent the new technology is diffused through social networks. This will be measured in 2017.

In terms of gender equity, women were less likely to adopt the new technology (presumably due to worse access to factors of production, relative to men), but women were more likely to practice fertilizer microdosing when input kits were randomly assigned (group 1). The random distribution provided them with more equal access to the training and input kits than the other two social network targeted treatments. This result suggests that certain forms of social network targeting may reinforce gender inequities.

Productivity: *Results forthcoming.*

Sources

1. Fuglie, Keith, and Nicholas Rada. "Resources, Policies, and Agricultural Productivity in Sub-Saharan Africa." *USDA-ERS Economic Research Report 145* (2013).
2. Druilhe, Zoé, and Jesús Barreiro-Hurlé. "Fertilizer subsidies in sub-Saharan Africa." *Food and Agriculture Organization of the United Nations* (2012): 2.

GLOBAL HEADQUARTERS

101 Whitney Avenue
New Haven, CT 06510 USA
+1 203.772.2216 | contact@poverty-action.org

poverty-action.org