

Background:

There has long been acknowledgment among stakeholders that there is a problem with counterfeit agricultural inputs in Uganda. It has been difficult to accurately quantify the magnitude of this problem. Anecdotal evidence from recent years suggests that the quantity of poor quality or counterfeit/adulterated products on the market has not decreased, and that the problem may have actually gotten worse. These poor quality products can have a devastating impact on the farmers who purchase them, representing not only a lost investment but potentially a lost season and the loss of the household's primary source of income. A 2017 study conducted in Uganda found that 30% of nutrients were missing from fertilizer purchased from retailers versus straight from wholesalers, and the hybrid maize seed sold at retailers contained only 50% of the authentic seeds that come from wholesalers¹. The prevalence of these products has also greatly undermined trust in the agricultural inputs market in Uganda. A survey conducted by the International Food Policy Research Institute found that 40% of Ugandan farmers believe the quality of most or all hybrid maize is lowered by adulteration or counterfeiting².

Uganda's agrodealers are on the front lines in the fight against counterfeits, and bear the responsibility for ensuring that their customers have access to quality products. The agrodealers take this responsibility seriously, and are eager to maintain their reputation and their relationships with their customers.

Our team sought to better understand how these agrodealers navigate the uncertain input market – how they decide what to purchase, their strategies for avoiding counterfeits, and how they interact with their customers. As a key linchpin in the fight against counterfeits in Uganda, we felt it was important to conduct thorough qualitative research into how agrodealers are coping with the challenges they face.

In this discussion, it is crucial to recognize the nuance between a “genuine, authentic” product and a “quality” product. Genuine seeds are those that can be verified as having come from a manufacturer, and have not been adulterated along the supply chain once they leave the facility. These genuine seeds are not necessarily high quality; some manufacturers are notorious for producing seeds with low germination rates and low yields. A quality product is one that has a high germination rate and a high yield.

Throughout this memo, we refer to “improved” seeds. Improved seeds are cultivars that have been specifically bred to be successful in certain climates, have high germination rates, have high yields, efficiently use nutrients, and otherwise meet the needs of growers. Improved seed

¹ Tessa Bold, Kayuki C. Kaizzi, Jakob Svensson, David Yanagizawa-Drott; Lemon Technologies and Adoption: Measurement, Theory and Evidence from Agricultural Markets in Uganda, *The Quarterly Journal of Economics*, Volume 132, Issue 3, 1 August 2017, Pages 1055–1100, <https://doi.org/10.1093/qje/qjx009>

² Ashour, M., Billings, L., Gilligan, D. O., & Karachiwalla, N. (2014). *Evaluation of the impact of e-verification on counterfeit agricultural inputs and technology adoption in Uganda, Baseline Report* (Technical report). Washington, DC: International Food Policy Research Institute.

encompasses both hybrid and certain OPV (open-pollinated varieties) seeds. Hybrid seeds are bred under very specific conditions; they are the first generation offspring of two specially chosen parent plants. They tend to have uniform characteristics and therefore result in more predictable crops. The hybrid crop will not “breed true,” and will produce offspring with a wide range of characteristics, different from itself, so saving the seeds and planting a second generation crop will most likely have degraded results. OPVs come from a stabilized genetic line, and their offspring will be mostly similar to the parents. The offspring may become different if pollen from a plant of the same species but a different variety reaches the crop. OPVs tend to have lower yields and be less successful than hybrids. Hybrid seeds are more expensive than OPVs, since they can often require hand-pollination or special processes. Hybrid seeds also tend to produce even more robust crops and better yield than OPVs, but both still fall under the umbrella of “improved.”

In contrast to these improved seeds are local seeds, also referred to as home-saved or recycled. These are seeds farmers save from one crop and plant in the next. Since tight quality controls do not exist on small-holder farms, these plants tend to have degraded genetics. Pollen from neighboring farms with different varieties will mix and create destabilized genetic lines with unknown characteristics. This results in lower germination rates, lower yields, and less resistance to climate shocks.

Goal and Approach:

Ultimately, we would like to understand how much influence agrodealers have over the type of seed a farmer purchases and strategies for leveraging that influence to increase farmer adoption of improved seed products. This case-based exploratory research aimed to achieve that through gathering information about how agrodealers perceive and react to counterfeits, how they make decisions about which seed companies to buy from, how relationships with companies are structured, and what products are popular with farmers.

Over the course of two days in July 2018, our team conducted one-on-one interviews with 17 different agrodealers. Interviews were semi-structured in that respondents were questioned with a script, but follow-up questions were often posed to shape a longer discussion. A translator fluent in many local languages assisted when necessary. For respondents uncomfortable with English, the interview was conducted wholly in their local language. For other respondents, clarification in local language would be offered if they seemed to not understand the question. After the first day of interviews, a review of responses determined that more targeted questions could be asked in order to get more focused answers. Since some questions may have only been asked on the second day of interviews and not the first, there are numbers presented here that do not reflect the entire sample population of 17. Some response data may not reflect the entire sample population for other reasons; some agrodealers may not have provided a clear response to a question or time constraints may have prevented it from being asked to all interviewees.

Agrodealers were identified using a combination of convenience sampling and snowball sampling within the Market Street area of Mbaletown. Shops were first identified by walking Market Street and looking for stalls with signs advertising agricultural products. Agrodealers were then asked to identify other shop keepers selling similar products. This may lead to bias in the responses, in that the shopkeepers likely to be in a central location, have more visible stalls, and know each other may be more similar to each other and not representative of the population at large. However, given challenges in the Ugandan setting of identifying the population of agrodealers and traveling to multiple different locations, a convenience sample is a simple, feasible way to collect information. Bias may also arise from the fact that Mbale was a target district for USAID's Kakasa advertising under the AgInputs program. This may mean that this region may have a higher awareness of scratch labels than other areas.

Each interviewee (plus a few agrodealers who could not be interviewed one-on-one due to time constraints) was invited to a half-day focus group to broaden the discussion on these issues. Twenty-two agrodealers participated. The focus group also had a script of questions from the facilitators, but was formatted to allow for discussion among participants. Follow-up questions were asked based on the responses from agrodealers in order to encourage deeper discussion of the topics. At first, one group discussion was held in English, again with a translator present to help with clarification. As more participants arrived later, two groups were formed, one conducted in English, and one led in Lugandan by the translator. This allowed for a smaller setting so more people felt comfortable participating, gave each individual more time to speak, and allowed those less comfortable with English to use a more familiar language. Participants were compensated with transportation reimbursement and lunch at the end of the session.

Findings:

In discussions with agrodealers, questions were structured in broad categories. For each topic, key themes and patterns emerged across responses. This section characterizes the information learned from agrodealers, as well as some possible explanations and implications of those responses.

Brand offerings:

Agrodealers' procurement decisions are very strongly tied to customer demand. Farmers tell agrodealers which brand they want and then the agrodealer places orders with a company. When prodded how price affects their decision making, agrodealers maintained that they could not consider price, and could only stock the varieties requested by their farmers. If an agrodealer chooses not to stock a product that customers want, they will lose those customers to one of the many competing shops in the area that may have chosen to stock that product.

Farmers' seed preferences tend to be very ingrained and agrodealers report that they have little power in convincing farmers to use certain products. The entrenched nature of seed preferences may come from the inherently risky nature of agriculture. If a farmer has been

using a certain brand and finds the germination rate and yield adequate, he/she will keep coming back to the product he/she knows. If what he/she has been doing is working well enough to get by, there is low risk tolerance to switch to a new product, even if it may claim much higher yields. Because of these entrenched preferences, incentives offered by seed companies to encourage agrodealers to purchase their products may be ineffective. Agrodealers will not purchase from a company if the farmers are not requesting it. Agrodealers may not be the leverage point for promoting quality seeds.

Pack size offerings:

All agrodealers reported that 2kg is the smallest seed pack they sell. When asked what size they sell the largest quantity of, agrodealers unanimously reported 2kg. Of the 16 agrodealers asked if customers ever request a pack size smaller than 2kg, 94% said yes. One kilogram and half kilogram bags are frequently requested. Of the 8 agrodealers asked a follow-up question inquiring if many or few people request smaller pack sizes, 75% responded that many people asked for these products, and 25% said it was an infrequent request. Customers inquire about these products because:

- They have a small plot of land and need a small quantity of seeds
- They would like to purchase an odd size of seeds to keep costs down (ie, 3kg)
- They would like to try a new product and only want a small quantity

When asked directly if they would ever open a seed pack and measure out a smaller volume for customers, respondents tended to be evasive. Of course, no one wants to go on the record admitting to this practice, since MAIFF has outlawed it and could confiscate items from the shop. Sometimes, the fact that an agrodealer will measure out seeds would come out as part of a discussion about something else. Reviewing the entire interview transcripts for mentions of how an agrodealer responds to customer requests for smaller packs, we found varied responses:

- 10 admitted to opening the pack and weighing some out for the farmer
- 3 said that they turned the customers away
- 2 encouraged the customer to find someone else to split the pack with

Counterfeits:

Almost all of the agrodealers claimed to never have had an experience with counterfeit seeds or to know where they come from, which is unsurprising. When pressed, four agrodealers believe the companies themselves produced fake seeds, four did not know where the seeds came from, one blamed other agrodealers adulterating product, and one believed that employees of the seed companies were using the genuine packaging to sell low-quality seed on the side. Agrodealers were unanimous in saying that no one had ever tried to sell them fake seed. A few had experienced instances where the seed they received from a company would

fail to germinate. In all of these instances, they contacted the company and received replacement seed.

There were mixed responses on how an agrodealer evaluates a pack of seeds to determine if it is counterfeit or genuine. Results are summarized in the table below.

Technique	Tally of agrodealers
Look for scratch label	8
Check to see if lot number on blue MAIFF label matches lot number on seed pack	3
No way to tell	3
Appearance of seeds themselves	2
Examine packaging design	2

For context, the blue MAIFF (Ministry of Agriculture, Animal Industry, and Fishery) label is a government provided tag that is placed on seed packs coming from crops which have been inspected in the field and from which a sample has been taken. It is meant to serve to indicate that the seed is unexpired and has not been adulterated. This tag is required to be on all maize seed packs. It should be noted that MAIFF’s inspection services are notoriously overburdened, and do not have the capacity to provide quality inspections to the extent needed.






Interestingly, agrodealers were split on the scope of the counterfeiting problem. Twelve agrodealers were asked if counterfeiting affects many farmers or only a few. Respondents were split down the middle: six believed that many farmers were affected by counterfeits, and six said that only a few people were affected by the problem. Of those who said counterfeiting

affected a smaller number of farmers, three of these agrodealers made sure to emphasize that the impact on those people was high, so counterfeiting is still an important issue to resolve. The even split in beliefs about the scope of impact highlights the challenges that have persisted in quantifying and understanding the “fake seeds” problem. Anecdotes abound, but it is difficult to collect hard evidence. There is a myriad of other problems in the seed market, including low quality products and the improper use of genuine seeds, so it can be difficult to tell when poor germination and low yield are the direct results of counterfeiting instead of other issues.

Verification programs:

All of the agrodealers had experience with electronic verification programs. It is important to note that regardless of whether a scratch label sticker was AgVerify, Kakasa, or KEPHIS, all agrodealers referred to such a system as “Kakasa.” Even though technically Kakasa only indicates authenticity while AgVerify and KEPHIS indicate quality inspection and authenticity, any scratch label is interpreted by them to mean high quality. It should be noted that all of these programs rely on the technology of a company called mPedigree.

Program	Implemented by	Quality verification?	Authenticity verification?	Picture
AgVerify	Private company	X	X	
KEPHIS	Kenyan government parastatal	X	X	
Kakasa	Uganda National Bureau of Standards and private companies		X	

Agrodealers reported that farmers were very aware of the programs, and had extremely strong buy in. This is a double-edged sword: it means that farmers specifically request products with a scratch label and value quality, but it would also cause farmers to suspect an agrodealer of counterfeiting if he/she sold products without the scratch label. Some companies had the scratch label on only a portion of their products, while some did not participate at all. As one agrodealer explained, “Some maize does not have Kakasa. So when the farmers come here and

find products without Kakasa, they will say those are fake products and the blame is shifted to the agrodealers.”

In addition, it was reported that the SMS-based verification system often was not working properly. Several agrodealers in the focus group stressed this difficulty. Farmers would send an SMS containing the code on their label to a special phone number listed on the label, but would then receive an error message that the system was down. During normal operation, the farmer should receive a reply SMS indicating if the code on the label is valid or not. An invalid code would indicate expired or faked product. When pressed on how often the error message happened, one agrodealer estimated that, in ten scratches, only four would receive proper verification responses and the other six would be errors. Since all programs are referred to as “Kakasa,” it is unclear which of the three scratch labels on the market had these problems. The errors in the system were often interpreted as an indication of fake products, with agrodealers bearing the blame and anger of customers.

AgVerify will not be continuing beyond 2018. It is unclear how prevalent the scratch labels will be in the future, even as farmers have trust in them. The lack of scratch labels in the future may result in farmers distrusting agrodealers and seed companies. Conversely, it is important that a quality-inspection element be central to any future verification programs. If companies that produce lower quality seed begin attaching scratch labels to their authentic but poor yield products, the meaning of the label becomes diluted. Only seeds that have been independently verified as providing a high value to customers should be able to use scratch labels. All labels should be signals of both quality and authenticity.

Barriers to using improved seed:

From the perspective of agrodealers, there are several main reasons more farmers do not purchase improved seed. Note that some agrodealers provided multiple reasons:

1. Cost (10 respondents; 59%) – The improved seed is much more expensive than the local variety. One agrodealer explained that a 2kg pack of improved seed may cost from 12,000 UGX to 17,000 UGX, while 2kg of the local seeds only costs around 1,000 UGX.
2. Risk aversion (5 respondents; 29%) – Concerns with counterfeits discourage farmers from trying a new product and eschewing the local seed. If the local seed has been working adequately and allowing the farmer to get by, he/she will be very unwilling to make the higher investment on improved seed.
3. Positive experiences with local seeds (3 respondents; 18%) – Three agrodealers explained that, because local seeds had been providing a sufficient harvest, farmers were unwilling to switch. They were satisfied with the performance of these home saved, local seeds and therefore had no interest in trying a new product.
4. Bad experiences with improved seeds (1 respondent; 6%) – One agrodealer claimed that the improved seeds offered the same yield as the local variety, and therefore farmers did not think they were worth purchasing. Another agrodealer alluded to a similar issue

when discussing improper use of products, explaining “He’ll come here and say, I need NASECO [a specific seed brand], this type of brand or grade which is supposed to be grown in the high lands, but instead he plants in the low lands. And then the yields don’t turn out to be good.”

Agrodealers were asked if the majority of the farmers throughout the country had been sensitized to the high yield potential of improved seeds, to gauge if education was a primary factor hindering the adoption rates of these products. Of those who answered, 11 agrodealers said that most farmers are aware of improved seeds offering the potential for higher revenue, and the factors above preventing them from using the products. Three agrodealers believed that only a small fraction of farmers are aware.

Further Investigations:

Common themes and areas for improvement emerged in our conversations with agrodealers about the seed market. Hearing similar concerns echoed suggests that these issues are ripe for further exploration in order to evaluate how addressing each one can improve the sector. Below, we highlight some of these common concerns and provide suggestions to begin addressing them.

Reasons for lock-in:

Agrodealers report that farmers demonstrate high levels of lock-in for their seed brands of choice. Once a farmer has loyalty to a brand, agrodealers do not believe that they can change that. Understanding how these preferences form and the key reasons for why they persist can be valuable in developing strategies for promoting quality seed. Farmers could be interviewed about how they make decisions about products. Possible reasons include aversion to risks associated with trying new products and lack of access to trustworthy information.

Encourage continuation of scratch label verification:

Given the high buy in for electronic verification programs, it is important to ensure that they continue in future seasons. As discussed above, these programs should have quality certification component, such that quality standards must be met in order for a company to use the scratch label. Most farmers and agrodealers already interpret scratch labels as signals of quality, so it is key to align the process behind the labels to these ingrained expectations.

Training agrodealers on agricultural practices:

As discussed above, agrodealers are not a leverage point for promoting specific products, but, as a conduit between company representatives and farmers, they may be positioned to provide farmers with valuable information. Once a farmer acquires improved seed, it is important that he/she uses proper planting and cultivation methods in order to achieve the high yield

promised, which will increase the return on investment and build trust in modern agriculture. High success will build that specific farmer's confidence in modern agricultural practices and may have spillover effects that encourage other members of the community to try these products. Therefore, investments should be made in training agrodealers on the proper agricultural practices and encouraging them to pass this information on to their customers.

Loans to increase access to improved seeds:

High cost is the largest barrier to farmers using improved seed. Low-interest loan programs could make these products more accessible. It is crucial that these be offered in tandem with education on the proper planting and cultivation of improved seeds. Ideally, the farmers accessing these loans may be those who are trying improved seeds for the first time and unfamiliar with the best techniques to achieve a high yield. Therefore, training on how to get the most value out of the seeds will be needed to increase the likelihood that farmers pay back the loans.

Strengthening extension programming:

Telling farmers about the benefits of improved seed is good, but showing them is even better. This could be achieved through expanded networks of extension agents who can work directly with farmers to ensure they are using the correct agricultural techniques to achieve high yields. While agrodealers do stand to gain by growing their customer base if they go out to communities and demonstrate the benefits of improved seed, they are reluctant to fill this role due to costs associated with transportation and communication. Seed companies also have incentives for providing this service so as to grow their customer base. One major seed company already engages in such an initiative, and others companies should be encouraged to follow suit. While the Ugandan government aims to provide extension services, their workers are stretched thin and are very limited in the number of farmers they can reach. If possible, the government should be encouraged to invest money in bolstering these services.

Smaller pack offerings:

Companies should be encouraged to provide seeds in 0.5kg and 1kg sealed packages. Many customers are interested in these products, and offering them may grow a company's customer base and increase sales, while increasing the adoption rate of improved seeds. Smaller pack sizes will benefit agrodealers, who sometimes turn customers away or put themselves at risk by weighing a small portion from a bulk bag, which is illegal.