EAST-WEST SEED FOUNDATION

KNOWLEDGE TRANSFER

# Pumpkins in Africa

## Catalyzing opportunity for farmers and consumers (2020–2024)

Funded by World Food Prize Laureate Simon N. Groot

**Project Report**

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|---|---|
| **Project name** | **Pumpkins in Africa**<br>Catalyzing opportunity for farmers and consumers (2020-2024) |
| **Organization** | East-West Seed Knowledge Transfer Foundation - Uganda |
| **Contact person** | Joshua Mwanguhya: mwanguhua.joshua@eastwestseed.com |

## Project achievements summary (July 2020 to January 2024)

| | Target | Achieved | Variance |
|---|---|---|---|
| **Demos** | 480 | 520 | +40 |
| **Training events** | 2,400 | 2,851 | +451 |
| **Farmers reached** | 7,200 | 14,095 | +6,895 |
| **Average ROI** | **Total Production (per 250 sqm)** | **Costs** | **Net Profit** |
| | 621 kg | $23 | $104 |

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## EXECUTIVE SUMMARY

East-West Seed Knowledge Transfer Foundation (EWS-KT) implemented the Pumpkins in Africa project, usually called simply the Pumpkin Project, from July 2020 to January 2024. The project was funded by East-West Seed founder Simon N. Groot, who donated his 2019 World Food Prize money to EWS-KT to build a sustainable pumpkin value chain in Uganda, with an eye toward Africa at large. The baseline study revealed women as the key pumpkin value chain actors (64.4%), and the project interventions were vital to building their capacity to engage more actively in the vegetable sector.

In line with achieving the project goals, 520 pumpkin farming demonstration plots were completed, reaching 14,095 farmers through practical training events. 26 radio talk shows were held to create mass awareness about extensive pumpkin production and to strengthen collaboration among key stakeholders along the pumpkin value chain. 173 pumpkin nutrition awareness campaigns were conducted within the project areas, which were key to increasing the consumption of and demand for pumpkin.

Such interventions were central to catalyzing opportunities within the pumpkin value chain by opening competitive opportunities for seed companies to extend quality services to farmers, hence improving quality seed accessibility to last-mile farmers. These interventions align with UN Sustainable Development Goal 2 to end hunger and malnutrition.

The project impact is reflected by increased pumpkin production levels, active engagement of stakeholders like bulk pumpkin buyers in the pumpkin value chain, demand for quality pumpkin seeds, and increasing competition among seed companies in the project areas. The Pumpkin Project has opened new opportunities around pumpkin, and EWS-KT plans to capitalize on these accomplishments to scale up the pumpkin sector in Uganda and beyond.

## 1.0. PROJECT BRIEF

Upon winning the prestigious World Food Prize in 2019, East-West Seed founder Simon N. Groot donated his award money to East-West Seed Knowledge Transfer Foundation to implement a 3-year Pumpkins in Africa project in Uganda, with the aim of catalyzing opportunities for vegetable farmers, consumers, and other vegetable value chain actors. The long-term objective of the Pumpkin Project was to accelerate the growth of the pumpkin sector in Africa by developing a hub of expertise and knowledge that could drive pumpkin production in neighboring markets.

### 1.1. Introduction

Uganda is considered the heart of pumpkin production in East Africa. However, despite its potential, pumpkin was widely considered a supplementary crop, with almost complete lack of attention from farmers and markets. Very few farmers grew pumpkin on a large scale, and most of those who grew pumpkin did not use quality seed. Farmers primarily produced pumpkin for family consumption and sold a smaller portion of the produce.

The predominant use of low-quality seed alongside inadequate management practices resulted in a wide variation in yields, and pumpkin was rarely treated as a commercial crop. However, that was simply due to a wide gap in effective production knowledge and a serious miscalculation of pumpkin's market potential.

## 2.0. PROJECT IMPLEMENTATION

The project commenced on 1 July 2020. A team of 4 full-time Technical Field Officers (TFOs) and 1 Team Lead were assigned to the project, with support from the Monitoring, Evaluation, and Learning (MEL) Officer and the Finance Officer. The project was implemented in the West Nile region, covering Arua district; the Northern region, covering Alebtong, Gulu, Kole, Lira, and Omoro districts; the Eastern region, covering Mbale and Tororo districts; and the Central region, covering Mityana district.

### 2.1. Project baseline survey

Before project implementation, a market assessment survey was conducted on pumpkin demand, marketability, and consumption in the suggested project areas (11 districts in the Eastern, Northern, and West Nile regions). The intention was to assess pumpkin consumer behaviors in the different proposed project areas, identify specific pumpkin-producing areas, and identify the key stakeholders engaged in the entire value chain. The survey targeted the major pumpkin value chain actors, mostly wholesale traders, consumers, and value-addition buyers. The study results indicated that women (64.4%) dominated pumpkin businesses. The study identified July to November as the highest pumpkin market supply period, with November being the peak month, whereas the period from January through June was a pumpkin scarcity period. That meant there was an opportunity gap for farmers to exploit under the Pumpkin Project to address periods of pumpkin scarcity due to local pumpkin variety seasonality and low productivity from January through June.

The study further found that pumpkins constituted less than 10% of the entire vegetable business for 70.4% of the wholesale traders who were selling them, even though most (95.5%) of the pumpkin wholesalers reported an increase in pumpkin sales since the inception of their pumpkin business engagement. That was an indication that the Pumpkin Project interventions would thrive and further develop the pumpkin production business in the area.

The study also found that most of the pumpkins on the market were local varieties, justifying the reason for pumpkin scarcity during the off-season period. This highlighted the need for the Pumpkin Project interventions to raise awareness of the best pumpkin farming practices that would result in increased and consistent pumpkin production and availability to serve the rising pumpkin consumption demand.

Furthermore, it was found that there was no specific pumpkin-producing community in the survey area, as no farmer treated pumpkin farming as a commercial enterprise. Producers-wholesalers-retailers-consumers and producers-retailers-consumers were found to be the most common pumpkin marketing channels.


## 3.0. KEY PROJECT OUTPUTS

### 3.1. Demo establishment, farmer training, and technical knowledge outreach

To achieve the project's goals, a strategy of establishing 250-square-meter commercial pumpkin demonstration plots in the project intervention areas was adopted. The intention was to create commercial pumpkin production awareness in the project areas, and to actively engage other pumpkin value chain actors, such as wholesalers and retailers, who buy the farmers' produce, and agro-input dealers, who supply quality agricultural inputs to the farmers. Value-addition stakeholders, who use pumpkin to prepare commercial food products, were also prioritized in the project interventions. They acted as catalysts to enhance the project's success and also were key to building sustainable structures that will further propel pumpkin production beyond the project period.

Over the entire project period, 520 demos (81 in the Central region, 153 in the Northern region, 165 in the Eastern region, and 121 in the West Nile region) were completed, on which 14,095 farmers (6,601 men and 7,494 women) were trained in commercial pumpkin production. The project interventions were central to changing the farmers' mindset

from considering pumpkin as a backyard crop that grows under minimal management practices to a commercial crop that can yield a reasonable income when well managed. This is evidenced by the increasing adoption of pumpkin production within the project areas.

To ensure that farmers thought of pumpkin farming as a business, pumpkin production business planning was conducted as the initial project training. This training guided the farmers to visualize and compare the pumpkin profitability case to other crops in order for them to make informed decisions about pumpkin production. Business planning training also aided the farmers in planning ahead for the crop inputs required throughout the production season.

Pumpkin's ability to be intercropped under a banana-coffee farming system emerged as particularly beneficial to farmers in the Central and Eastern regions. Intercropping not only addressed the land scarcity challenge faced by many women and youth, whose limited access to production land hampers their ability to venture into farming, but also enhanced productivity through efficient land utilization.

The pumpkin market survey found that very few farmers used quality pumpkin seeds, unlike for other vegetable crops. Instead, they used extracted seeds from the local pumpkin varieties, which could still give them fairly good results. However, that meant having one pumpkin production period, leading to pumpkin availability for only one season in a year. To address that, farmers were trained on seed selection and the different types of seeds. This was vital in raising farmers' awareness of the benefits of using quality seeds. The results of the training are evidenced by increased uptake of quality seeds, consistent pumpkin availability in the market, and increased hybrid pumpkin varieties in the market within the project area.

Over the years, farmers in the project areas have been exposed to poor farming practices that have led to massive environmental degradation. Therefore, the project supported farmers to enhance environmental productivity and sustainability. Farmers were trained about soil and water conservation practices under pumpkin production. Among the main practices shared were raised beds, which are key to efficient water utilization by the plants during the rainy season; mulching, which is vital in controlling soil erosion; organic manure, which enhances sustainable soil nutrient availability and maintains good soil structure; and minimum tillage, which minimizes leaching and loss of the soil structure. All of these good agronomic practices were intended to restore soil health and soil productivity for sustainable farming in both the short and long terms.

In the project areas, and across the entire country, the increasing scarcity of production land has resulted in continuous deterioration of soil quality, depriving the soil of the required nutrients for crops. This has led to a drastic decline in productivity and raised the need for training farmers on soil nutrient enhancement and management. The farmer trainings therefore focused on crop nutrition, with emphasis placed on the nutrients required by the plants at different stages, the different sources


of the required plant nutrients, and the signs and symptoms of specific plant nutrient deficiencies.

The farmers were also trained in fertilizer application methods. Some farmers' attitude toward using inorganic fertilizers was negative due to a lack of awareness about their use; however, the conducted training enabled them to appreciate the importance of properly calibrated inorganic fertilizer to address short-term plant nutrition needs, as a complement to the long-term sustainable farming practices under the project interventions to restore soil health and address productivity challenges.

Pests and diseases are among the major challenges facing the entire vegetable sector. For that reason, most farmers fear investing in horticultural crop production because they lack the required knowledge on crop protection and management. Throughout the project implementation period, farmers were trained in crop protection as a key strategy to boost their confidence in adopting pumpkin production as a business.

Among the priority pest and disease management methods were integrated pest management practices, which are environmentally friendly. Farmers were advised to use high-quality seeds that are tolerant of diseases and pests and to practice field management practices like maintaining proper field hygiene at all times, timely planting, and controlling pests and diseases using cultural, physical, biological, and mechanical practices.

Over the years, rampant pest and disease infestations have not only caused crop loss but also led to increased agrochemical toxication rates, since farmers resorted to massive use of agrochemicals with limited technical knowledge about their handling and usage. This emerged not only as an environmental degradation

threat but also as a health hazard to the farmers who mishandled the agrochemicals and the consumers who ate the farmers' produce. To address this challenge, a practical training session on the responsible use and handling of agrochemicals was conducted on each of the demos established.

This comprehensive training approach to pest and disease management was vital in reducing the misuse of pesticides, as the farmers were equipped with knowledge on alternative crop protection practices as well as on the right pest-specific pesticide to use if they decided to use pesticides. Having this knowledge was also more cost-effective for the farmers, since they could make informed decisions to use the appropriate product to address the specific pest challenge.

## 3.2. Pumpkin nutrition awareness campaigns

In addition to raising awareness on pumpkin production and marketing among the different pumpkin value chain stakeholders, mass sensitization about how to prepare and consume all parts of the pumpkin plant (leaves, flowers, fruit, seeds, and veins) was prioritized during Farmer Field Days. Creating more awareness about the nutritional benefits of pumpkin was key in increasing pumpkin consumption, which contributed to more healthy communities and also addressed food insecurity challenges, which are experienced mostly during the dry season by communities in the Northern and West Nile region project areas. Due to its shorter maturity period and longer shelf life, pumpkin has proved to be an excellent food security crop that can help address the climate change threats of shorter rainy seasons and prolonged drought in most of the project areas.

## 3.3. Stakeholder engagement through Farmer Field Days

To ensure active and sustainable stakeholder engagement under the project, 331 Farmer Field Days were conducted to create platforms for different pumpkin value chain actors to interact and exploit opportunities created by the project interventions. Among the key value chain stakeholders who were actively engaged were agro-input dealers, produce buyers, and value-addition enterprises.

Agro-input dealers were not only engaged during the Farmer Field Days but in all other project activities, in order to introduce them to the farming communities and to aid them in realizing the increasing demand for quality agro-input services created by project impact. This resulted in the extension of quality agro-input services to rural farmers, thereby addressing the challenge of quality agro-input accessibility, and also created market opportunities for the agro-input dealers.

Engagement of produce buyers in Farmer Field Days was key to addressing market accessibility, as the buyers' involvement in the project activities raised more awareness about pumpkin producing areas, which were mapped as the pumpkin production hubs in the community. These opportunities for interaction also created a strong and sustainable market linkage bond between the farmers and the produce buyers.

Furthermore, the Farmer Field Days created a platform for the farmers to interact amongst themselves, celebrate their success, and share their motivation to enhance community development through vegetable production.

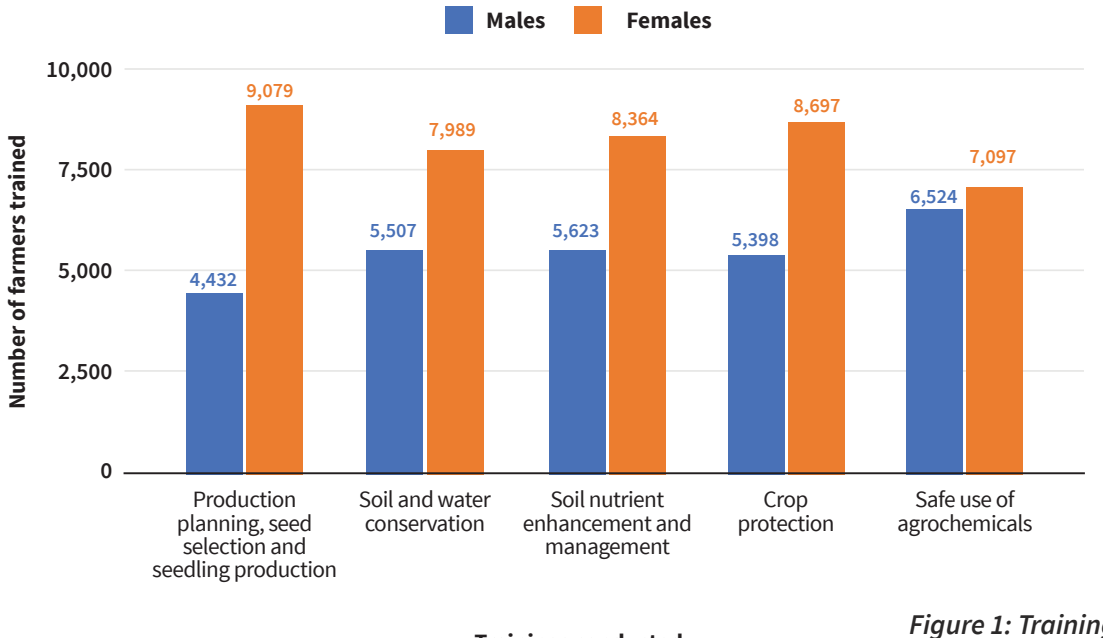


*Figure 1: Training outreach on the demos throughout the project period.*

## 4.0. PUMPKIN BUSINESS CASE PROFITABILITY ON THE ESTABLISHED DEMOS

All the demo data was documented and entered in the EWS-KT tracking app by the field team and was later analyzed through the data management system, as summarized in Table 1.

*Table 1: Average demo production data per 250 square meters.*

| Project Area (District) | No. of Demos | Average No. of Plants | Average Production (kg) | Average Production Cost ($) | Average Return ($) | Average Net Profit ($) |
|---|---|---|---|---|---|---|
| Alebtong | 30 | 90 | 629 | 24 | 109 | 85 |
| Arua | 121 | 80 | 633 | 24 | 129 | 105 |
| Gulu | 22 | 80 | 552 | 22 | 136 | 114 |
| Kole | 61 | 90 | 582 | 21 | 111 | 90 |
| Lira | 17 | 90 | 591 | 24 | 115 | 91 |
| Mbale | 78 | 86 | 725 | 23 | 124 | 101 |
| Mityana | 76 | 90 | 607 | 22 | 132 | 110 |
| Omoro | 28 | 85 | 585 | 22 | 133 | 111 |
| Tororo | 87 | 90 | 689 | 22 | 148 | 126 |
| | **Average** | **87** | **621** | **23** | **126** | **104** |

During the project period, 541 demonstration plots were established; however, 21 demos were destroyed by weather events, mostly hailstorms. The 520 successful demos produced an average of 621 kilograms of pumpkin per demo. An average of $23 was invested, which yielded an average $126 return and an average net profit of $104 per 250-square-meter pumpkin production area. This is equivalent to 9,936 kilograms of pumpkin per acre, with a production cost of $363, a return of $2,022, and a net profit of $1,659 per acre per season—a profitable business case that is convincing to most farmers for investment compared to many other crops they are growing in the project areas.

Within the above averages, there was huge variation in pumpkin prices from different project areas, which was dependent on factors like the time of year and the availability of local pumpkin varieties in the market. During the period when local pumpkins were available, the prices of Arjuna F1 pumpkins could drastically fall, mostly in the Northern and West Nile regions. That was because there is a big difference between Arjuna F1 and the local pumpkin varieties in terms of taste, size, texture, and flesh color, with the main consumer market segment demands much higher for local varieties.

However, the local pumpkin varieties are widely available in the market for only 4 months. During other times of year, Arjuna F1 is the best alternative; this period, therefore, is the best market opportunity for Arjuna F1 farmers.

Whereas there is a big difference between Arjuna F1 and the local pumpkin varieties in the Northern and West Nile regions, Arjuna F1 is somewhat similar to the local pumpkin varieties in the Central and Eastern regions. That makes it competitive on the market with the local varieties, even though the local varieties are more marketable in times of pumpkin surplus.

The location of the Eastern region project areas (Mbale and Tororo districts) at the border of Uganda and Kenya offers an extra market advantage to the pumpkin farmers in the area, as they always have a ready export market for their produce at better prices. That is not the case for farmers from other project areas, where pumpkin prices are generally relatively low. In the Central region, the proximity of Mityana district to Kampala (the capital city) offers an extra advantage of market accessibility to the farmers; in this case, the buyers who purchase the farmers' produce supply it to Kampala markets.

***Even though the local consumers prefer local varieties to Arjuna F1, value-addition enterprises and bulk buyers, who are mostly exporters, like Arjuna F1 because of its fruit uniformity and flesh color. The farmers also like it because of its productivity and fast maturity compared to the local varieties.***

## 5.0. MARKET LINKAGES AND PROJECT SUSTAINABILITY

With support from the project interventions, the farmers realized good results in terms of produce volumes. However, there was initially no market for their produce, since the pumpkin consumption levels in the communities were low. On top of that, the project areas were not known as commercial pumpkin-producing areas by the bulk pumpkin buyers. That led to losses for the farmers in the initial phase of the project. However, getting the right solution to address this challenge uncovered a sustainable opportunity that turned pumpkin production into a fortune for thousands of farmers in the project areas.

To address market challenges, EWS-KT collects weekly market information and shares it with farmers to update them about the different vegetable market trends. Analysis of the market information availed clear production trends based on the seasonality of pumpkins. This was instrumental in empowering farmers to properly plan for production, with informed estimates of future market prices to enhance their profitability. EWS-KT also engaged the pumpkin produce buyers in all the project interventions to create more awareness about pumpkin availability in the project areas, thereby offering the farmers a market platform since the buyers already knew the produce source.

Amidst project implementation, it was further realized that limited pumpkin production volumes and inconsistency in production were the main limiting factors to sustainable pumpkin market development, as small pumpkin volumes could not attract big produce buyers. However, that was addressed by advising and engaging the farmers to expand pumpkin production acreage and emphasizing collective production to raise reasonable quantities that attract bulk pumpkin buyers.

Field expansion by farmers, combined with collective production, has attracted many pumpkin stakeholders, mostly buyers from different locations within the country and beyond. This has led to a competitive market environment for pumpkin value chain actors, hence creating sustainable employment opportunities that will long drive rural community development in the project areas.

## 6.0. STAKEHOLDER REFLECTIONS

During project implementation, stakeholder reflection events were organized to gather stakeholder feedback and suggestions about the project interventions. This platform was vital in devising project intervention strategies that best suited the different project areas. This approach not only ensured that participating stakeholders owned the interventions but also opened opportunities for healthy collaborations with the key vegetable value chain actors in the respective project areas.

During a stakeholder reflection meeting held in West Nile, Terego district officials credited EWS-KT for taking the lead in the promotion of climate-smart farming technologies that conserve the environment and ensure maximum land utilization, and noted that their promotion of vegetable farming contributed to the doubling of vegetable production in Terego and Arua districts. The officials further reported higher market revenue due to increased vegetable marketing in the project area.

Agro-input dealers lauded the project's training of farmers, which raised awareness of the use of high-quality agro-inputs and opened opportunities for them.

The stakeholders also suggested some improvements; namely, increased engagement with value-addition partners in project interventions, strengthening market linkages to support the farmers to sell their produce, and further extension to other areas.

### 6.1. Agro-input sector engagement and capacity building

During the initial project implementation period, agro-input dealers were identified as key stakeholders to extend the project services to farmers beyond the physical project implementation areas, since they are major players in offering extension and quality agro-input services to the farmers. With increasing awareness about pumpkin production among farmers, the agro-input dealers were also encouraged to stock quality pumpkin seeds to serve the farmers' rising demand from the project areas.

Farmers interact with agro-input dealers whenever they go to buy inputs (seeds, fungicides, pesticides, fertilizers, farm equipment, etc.). Of the major challenges farmers present to the agro-input dealers, most are related to technical knowledge of crop nutrient deficiency, disease, and pest management. However, an Agro-Input Dealers Training Needs Assessment conducted by EWS-KT found that there was a technical knowledge gap among most of the agro-input dealers, which limited the quality of their technical training service delivery to the farmers they interacted with.

The study found that most agro-input dealers were conversant in advising farmers on seedling production, pesticides, fungicides, and fertilizer application. However, they reported a low understanding of disease diagnosis when farmers presented them with problems, which gave rise to incorrect diagnoses and inappropriate product recommendations. This dynamic results in continuous misuse of agrochemicals, which contributes to increased cases of disease pathogens, pesticide resistance development, and environmental pollution.

To mitigate these challenges, EWS-KT trained 44 agro-input dealers (31 men and 13 women) from 9 West Nile districts (Adjumani, Arua, Koboko, Madi-Okolo, Maracha, Nebbi, Paidah, Terego, and Yumbe) about crop protection, covering vegetable pest and disease identification, crop management, and responsible use of agrochemicals. Furthermore, the trained agro-input dealers were introduced to EWS-KT training materials and the GrowHow **(growhow.eastwestseed.com)** platform so they could easily access technical training materials whenever they needed them.

## 7.0. PROJECT IMPACT ON COMMUNITY DEVELOPMENT

Due to its low cost requirement, pumpkin production has provided the best opportunity to low-income earners, mostly women and youth in the project areas who cannot afford to invest in other vegetable crops that require higher investment. Furthermore, the simplicity of this crop's management has been vital in driving the project's success for even farmers with little technical knowledge.

A combination of the above factors has led to inclusive participation in pumpkin farming, along with a changed mindset toward pumpkin as a commercial crop. This has resulted in increased demand for quality pumpkin seed and improved accessibility of agro-input services in the project areas, the combination of which guarantees sustainable pumpkin value chain development within and beyond the project areas. In addition to the engagement of all the vegetable value chain actors in the project interventions, the engagement of local community structures, mostly local government authorities and extension stakeholders, was vital in ensuring the continuation of project activities beyond the project period.

### 7.1. Project impact on the agro-input sector

Increased awareness about pumpkin production as a business due to the project interventions has unlocked the pumpkin seed sector potential. The increasing pumpkin seed market demand by the farmers has attracted other seed companies to tap into the created pumpkin market. While the project has resulted in a positive competitive market advantage for East-West Seed among the seed companies, the higher market demand has also resulted in increased sales of quality seeds for other brands. This has in turn initiated the sales of other agro-inputs, since seeds are the main driving factor of agro-inputs like fertilizers, pesticides, and fungicides.

*Table 2: Pumpkin seed varieties that have come on the market in the project intervention areas.*

| | Pumpkin Variety | Company | Package Weight | Price (Ugandan Shillings) | Traits/Attributes | Fruit Size |
|---|---|---|---|---|---|---|
| **West Nile and Northern Regions** | Orange Flesh | Simlaw Seeds | 50 g | 15,000 | Soft, orange flesh, 75-90 days maturity period | Medium (2 - 3 kg) |
| | Small Sugar | East African Seed | 50 g | 15,000 | Medium soft, 75-90 days maturity period | Small (1.5 - 2 kg) |
| | Degro | Degro | 50 g | 20,000 | Medium soft, very sweet, 105 days maturity period | Big (2 - 5 kg) |
| | Arjuna F1 | East-West Seed | 10 g | 15,000 | Soft, orange flesh, 75-90 days maturity period | Big (2.5 - 5 kg) |
| | Waltham Butternut | Top Harvest | 10 g | 7,000 | Soft, orange flesh, 45-60 days maturity period | Small (1 - 1.5 kg) |
| **Eastern Region** | Orange Flesh | Amazon Seeds | 50 g | 15,000 | Soft, orange flesh, 85-110 days maturity period | Big (4 - 5 kg) |
| | Orange Flesh | Simlaw Seeds | 50 g | 15,000 | 75-90 days maturity period | Medium (2.5 - 4 kg) |
| | Arjuna F1 | East-West Seed | 10 g | 15,000 | Soft, orange flesh, 75-90 days maturity period | Big (2.5 - 5 kg) |
| | PK 449 F1 | Africasia Seeds | 1 g (4 seeds) | 17,000 | Hard, yellow flesh, oval shape | Big (5 - 15 kg) |
| **Central Region** | Arjuna F1 | East-West Seed | 10 g | 15,000 | Soft, orange flesh, 75-90 days maturity period | Big (2.5 - 5 kg) |
| | Orange Flesh | Simlaw Seeds | 50 g | 15,000 | 75-90 days maturity period | Medium (2.5 - 4 kg) |
| | Pumpkin for Boss | Golden Bull (U) Ltd | 10 g | 10,000 | Soft skin, oval shape, 75-90 days maturity period | Medium (2.5 - 4 kg) |
| | Pumpkin Small Sugar | East African Seed | 50 g | 15,000 | Medium soft, sweet, 75-90 days maturity period | Small (1.5 - 2 kg) |
| | PK 449 F1 | Africasia Seeds | 1 g (4 seeds) | 17,000 | Hard, yellow flesh, oval shape | Big (5 - 15 kg) |
| | Yellow Deli 400 2 | Rock Seeds | 10 g | 2,000 | Yellow flesh, oval shape | Big (4 - 5 kg) |

## 7.2. Project impact on the pumpkin business sector and value-addition stakeholders

Increased pumpkin production in the project areas ignited pumpkin subsector investment and development. This is evidenced by more extensive production by farmers and bulk pumpkin production that continues to attract bulk pumpkin buyers, both exporters and importers. Active involvement of such key stakeholders in the value chain further unlocks pumpkin production profitability, thereby enabling a sustainable pumpkin production environment under a symbiotic relationship that creates a win-win dynamic for all the stakeholders involved. Furthermore, increased and consistent pumpkin production has attracted value-addition stakeholders who manufacture pumpkin-based food products. They testify that consistent pumpkin produce availability addresses their raw material needs throughout the year. The physical attributes of Arjuna F1—its flesh color, fruit size, uniformity, and softness—give it a competitive advantage over other emerging seed companies' pumpkin varieties to exploit the value-addition and export markets.


## 7.3. Project impact on East-West Seed pumpkin seed sales

The Pumpkin Project interventions have been an important tool to catalyze complex pumpkin production sector opportunities. The establishment of commercial pumpkin demos, awareness creation about pumpkin production profitability and pumpkin as a commercial crop, pumpkin nutrition awareness campaigns, mass media engagements, and increasing pumpkin production visibility directly contributed to increased awareness on the use of quality seeds and other inputs. This, in turn, directly contributed to the development and expansion of agro-input services close to rural farmers, thereby addressing the accessibility gap for quality agro-inputs in rural communities.

Farmers make independent decisions about variety selection. Amidst the growing pumpkin seed market competition with other seed companies, East-West Seed has leveraged the market opportunities created by the project interventions and has registered a significant increase in pumpkin seed sales ever since project inception.

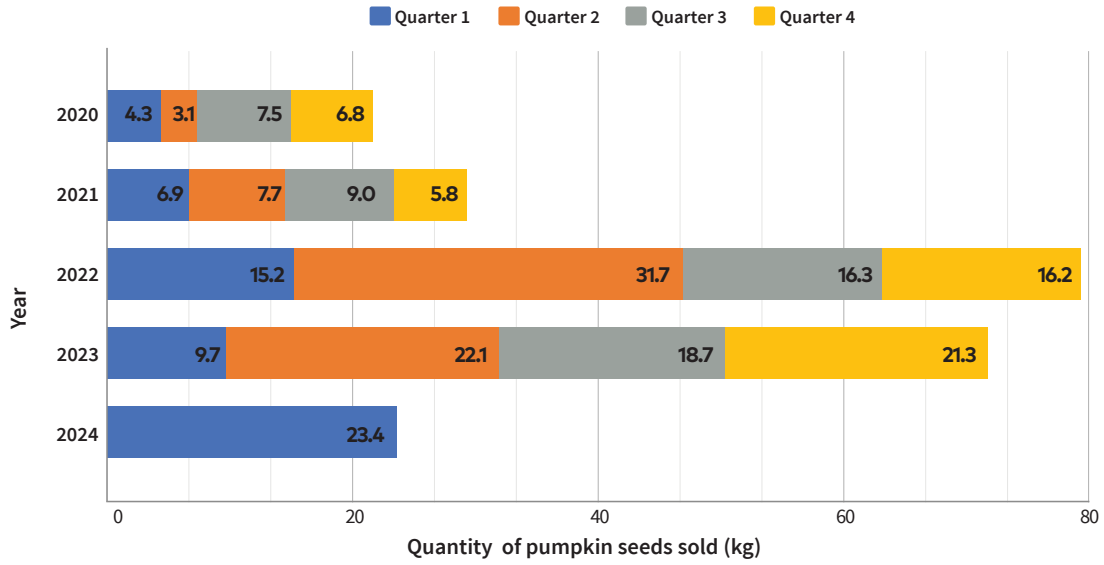


*Figure 2: East-West Seed pumpkin sales trends since project inception.*

## 8.0. DIGITAL MEDIA AWARENESS CREATION

To reach more farmers and other vegetable value chain actors within and beyond the project areas, the project prioritized mass media pumpkin production awareness campaigns, which were achieved through conducting radio talk shows on different radio stations in the project areas, newspaper article publication, and digital media platforms like Facebook and WhatsApp. During the project period, 26 radio talk shows (6 in Northern, 7 in Eastern, 3 in Central, and 10 in West Nile) were conducted in collaboration with other vegetable value chain actors, mostly agro-input dealers and district agricultural departments. In addition, 3 news articles about pumpkin production and value-addition enterprises were published in national newspapers, and 53 Facebook posts specifically raising awareness about pumpkin production benefits and sharing testimonies by successful pumpkin farmers were posted on the Uganda Vegetable Farming Facebook page, reaching 9,732 people.

## 9.0. LESSONS LEARNED

Facilitating market connections by linking the farmers to buyers, and the buyers to farmers, addressed the main barrier to pumpkin production. This not only accelerated extensive pumpkin production but also created competition among the produce buyers, which is beneficial for the farmers.

Because pumpkin farming requires minimal production costs compared to other vegetable crops and is able to be intercropped with plantation crops like banana and coffee, it is an accessible crop for marginalized farmers, mostly women and youth, who have limited investment capital and land for production.

Increasing awareness about pumpkin production as a commercial crop in the project areas has attracted other seed companies to build on the project's success by selling their products.

Sharing the return on investment from completed demonstration plots with the farmers during training sessions and events was a great motivational factor that inspired many farmers to understand the possible attainable profits under commercial pumpkin production.

Open sharing of market information with farmers was a vital motivational tool, and the updates on different vegetable market trends enabled farmers to properly plan for production and to target harvest dates to exploit the better prices in the off-season.

Agro-input dealers' lack of sufficient knowledge on agrochemicals has played a major role in increasing pests' and pathogens' resistance to agrochemicals. Due to their limited knowledge on agrochemicals' mode of action and active ingredients, agro-input dealers share incorrect information about agrochemicals with the farmers. That has resulted in increased pest and disease rates that sabotage the entire horticultural sector.

Active engagement of key vegetable value chain stakeholders, mostly agro-input dealers and produce buyers, in the project interventions was vital in building sustainable, self-sufficient

community development structures that will continue to exist beyond the project period.

Raising awareness about pumpkin consumption and nutritional benefits during project interventions was central to increasing pumpkin consumption rates in the project areas, thereby creating local markets for the farmers and also contributing to nutrition behaviors that improve the health status of the community.

## 9.1. Challenges and responses

| Challenge | Response |
|---|---|
| Covid-19 epidemic outbreak at the initial project phase, which limited our movements and outreach during this period | • Implementation of the Ugandan Ministry of Health's Covid-19 prevention recommendations during project operations.<br>• Training Community-Based Volunteer Trainers, who were effective in supporting farmers within their respective communities.<br>• Printing and distributing more crop guides, which have clear illustrations and are available in farmers' local languages, for easy guidance on vegetable production and crop maintenance.<br>• One-on-one training engagements on different training topics with the key farmers, who then trained individual farmers who visited their demo plots.<br>• Encouragement of the key farmers to use crop guides to extend a technical hand to support fellow farmers in the community.<br>• Strategic demo establishment along very visible places to attract more farmers with learning interest at times that are convenient for them. |
| Weather calamities, mostly hail, that destroyed 21 demos over the entire project period | • The less affected demos were boosted by applying CAN fertilizer and later recovered; 21 demos were damaged beyond recovery after assessment. |
| Farmers' negative attitudes toward considering pumpkin as a commercial crop during the initial period of the project | • Sharing the return on investment data from our previous pumpkin demos with farmers to help them understand the profit advantage of pumpkin investment.<br>• Sharing vegetable market information with farmers to aid them in capitalizing on existing pumpkin market opportunities.<br>• Nutrition awareness campaigns about pumpkin to stimulate local pumpkin consumption. This contributed to the creation of local markets within and beyond the project areas, while also improving community nutrition behaviors. |
| Limited market for rural pumpkin farmers | • Farmers were encouraged to expand production areas and also mobilized to collectively produce pumpkins so as to raise huge pumpkin volumes to attract bulk buyers, who offer better prices.<br>• Facilitation of market linkages between farmers and buyers. |

## 10.0. SCALING UP THE INTERVENTION

The Pumpkin Project is just the beginning of a long-term initiative to increase pumpkin production and consumption on the continent, starting in Uganda.

Simon Groot's decision to dedicate his 2019 World Food Prize funds to kickstart this initiative has resulted in a core of pumpkin farming expertise in Uganda and catalyzed the development of a commercial pumpkin sector led by smallholder farmers. EWS-KT plans to capitalize on these achievements and scale up this work through the following strategies:

- **Institutionalizing pumpkin training.** EWS-KT has already integrated training in pumpkin production into its other projects in Uganda and is committed to including pumpkins in all future projects and activities across the country.
- **Building local expertise.** EWS-KT currently has a Technical Field Officer fully dedicated to building the capacity of the East-West Seed team and agro-input dealers to provide technical advice on pumpkin enterprises, thereby embedding pumpkin farming in the extension services delivered by local actors.
- **Expanding access to finance.** EWS-KT is making efforts to collaborate with partners to design and implement an approach that assists farmers in accessing feasible finance options for the investment and uptake of scaled technology. This will catalyze the market development of the pumpkin sector through product improvement and diversification of providers of relevant pumpkin services, including business development support services and inclusive access to finance for all value chain actors.
- **Strengthening market connections.** EWS-KT is working in collaboration with East-West Seed to proactively create and support market linkage opportunities through exhibitions, Field Days, and trade missions. These efforts are aimed at developing the domestic pumpkin market through increased integration with pumpkin processors and other value addition stakeholders and through influencing consumption by raising public awareness of the nutritional benefits of pumpkins. A more robust domestic market for pumpkins will complement the growing export market to neighboring countries.
- **Growing agricultural input markets.** EWS-KT and existing pumpkin farmers will continue to demonstrate the income potential of pumpkin enterprises, increasing demand for quality seeds and other inputs. This opens competitive market opportunities for seed sales and creates conditions that are attractive for local agro-input dealers who provide last-mile access to better seeds, inputs, and advice for rural farmers.
- **Leveraging pumpkin as a nutritional powerhouse.** EWS-KT is preparing to work with non-governmental organizations specializing in nutrition to introduce pumpkin production to their beneficiaries across the country.
- **Expanding beyond Uganda.** EWS-KT is actively assessing how best to apply its experience with the Pumpkin Project in Uganda to stimulate pumpkin production in other African nations—and ultimately achieve Simon Groot's dream of "a million hectares of pumpkins in Africa."

## 11.0. PROJECT FINANCIAL REPORT

| Budget Category | 2020 | 2021 | 2022 | 2023 | 2024 | Total ($) |
|---|---|---|---|---|---|---|
| Personnel | 19,049 | 36,982 | 36,268 | 39,343 | 705 | 132,347 |
| Travel | 2,648 | 3,422 | 5,723 | 7,722 | 536 | 20,051 |
| Office and communications | 97 | 3,378 | 3,062 | 2,028 | 89 | 8,654 |
| Supplies and services | 0 | 1,974 | 5,341 | 3,484 | 196 | 10,995 |
| Meetings and workshops | 0 | 0 | 0 | 3,434 | 0 | 3,434 |
| Farmer demo inputs and training materials | 0 | 4,271 | 11,044 | 9,059 | 0 | 24,374 |
| **Total ($)** | **21,794** | **50,027** | **61,438** | **65,070** | **1,526** | **199,855** |

# Sparking a Pumpkin Revolution: Cynthia's Story

***Farmer: Cynthia Anyango***

***Age:*** *28*
***Location:*** *Agururu A Village, Tororo Municipality, Tororo District*

In my community, pumpkin was never considered an income-generating crop like other vegetables.

For that reason, the entire community (including myself) never took pumpkin farming seriously, although most households at least had a few plants in the backyard that survived by God's grace, with no management practices at all.

I am a single mother from Agururu A village, and I have been a key farmer under the Pumpkins in Africa project for the past two seasons, with technical support from East-West Seed Knowledge Transfer Foundation.

During the first season that I hosted a pumpkin-farming demonstration plot on my land, most of the community members laughed at me, thinking that I was wasting my farming space and energy. Facing this ridicule from the community, I thought about changing my plan, but the regular visits from my trainer kept me motivated to push on until the end of the season.

A month after transplanting my pumpkin seedlings, I realized something unique about the pumpkin plant: its leaves are edible. I started harvesting some of the leaves for my family's consumption. By the second month, I was selling the pumpkin leaves in our local market, and the same people who were laughing at me were the ones buying them.

When my pumpkins were ready, I successfully sold them to the buyers who came from the central market. By good chance, there were not many pumpkins at the time mine were ready, and that gave me an opportunity to sell them at a high price.

> *By the second month, I was selling the pumpkin leaves in our local market, and the same people who were laughing at me were the ones buying them.*

My demo plot sparked a pumpkin revolution in my community. Now many farmers in the community, mostly women, are engaged in pumpkin farming. Pumpkin farming is easy to manage and is turning into a fortune for us mostly low-income earners. The pumpkin leaves, flesh, and seeds also supplement our household meals, which keeps our families healthier.

**Collected by** Eunice Akello,
*Technical Field Officer*

# Engaging Women for Better Health and Income: Rose's Story

***Farmer: Rose Ssewakiryanga***

***Age:*** *50*
***Location:*** *Kiggogwa Village, Central Division, Mityana District*

I am from Kiggogwa village, and I am a member of the Village Health Team. My role with the Village Health Team is raising awareness about good health practices in the community, which involves community hygiene, mobilization for children's immunization, and sensitization on good nutrition practices for improved public health.

The Pumpkin Project in our community has simplified my community work. It has helped me to lay a strong foundation on nutrition awareness among the community members—mainly women, who are always responsible for household nutrition.

We use what we learned during farmer training to pass nutrition information on to the community members. Other than knowing pumpkins as a highly nutritious crop, we lacked enough knowledge on how to plant and manage them. With the Pumpkin Project interventions in our community, we are now well equipped to manage them for better production, using more effective methods than our traditional practices.

Through the training we received on our demo, we have also come to realize the differences between using improved seeds and using our local pumpkin varieties. For example, our local seeds take very long to mature, whereas the improved pumpkins mature very fast. Also, the improved varieties are high yielding compared to the local varieties.

We have also realized that pumpkins are an especially good crop for women. Because pumpkins can be intercropped with other common crops in our area—mainly coffee and bananas, which are our major cash and food crops, respectively—that gives us women production space, since we do not own land for production in most cases.

Pumpkin also comes with another advantage of being a less intensive crop, and it does not require much in the way of production costs compared to other vegetable crops like tomatoes, which are commonly grown here.

That is why you see more female farmers embracing pumpkin farming. Though the income from pumpkin production is not as much as the income from other vegetables, even the poorest household in the community can manage a pumpkin garden, which can boost household food security and serve their nutrition needs, leading to a healthy community.

**Collected by** Christine Ategeka,
*Technical Field Officer*

# Improving Community Nutrition: Gloria's Story

***Farmer: Gloria Surundu***

***Age:*** *35*
***Location:*** *Odrani Village, Logiri Sub-county, Arua District*

I am a single mother of one and a trained nurse by profession. I currently work with Logiri Health Center 3 in Arua district. I have been practicing farming, but mostly field crops like maize, cassava, and groundnuts. These require large acreages of land to be cultivated in order to realize a reasonable profit margin in a good season, and they have high costs of production.

I happened to learn about East-West Seed Knowledge Transfer when I visited our sub-county agriculture office to seek technical support on general vegetable production. My main aim for considering vegetable farming was because vegetables have high nutritional and market value, and also they have a shorter maturity period compared to other field crops I have been growing for the past years.

Through the sub-county Agricultural Officer, I was introduced to an East-West Seed Knowledge Transfer staff member who is an expert in my area of interest. I was selected as a lead farmer to host a pumpkin demo garden, and I was amazed by their training methodology. At my demo garden, other farmers are also trained in practical vegetable production, with trainings scheduled for each crop growth phase. An idea which began with self-interest turned out to be for the community's interest.

This has come as a blessing in our community, as not only do we learn about pumpkin farming for income generation but it also helps us to tackle malnutrition in our community, since pumpkins are very nutritious.

> *An idea which began with self-interest turned out to be for the community's interest.*

I have already started using the knowledge and skills gained from the trainings on the demo to impact my community, prioritizing my fellow women, especially those who are pregnant and breastfeeding, on top of continuing to practice my profession.

**Collected by** Simon Acidri,
*Technical Field Officer*

# Finding Profit in Pumpkin Farming: Richard's Story

***Farmer: Richard Mangodi***

***Age:*** *38*
***Location:*** *Maanyi Village, Maanyi Sub-county, Mityana District*

I am a teacher by profession and a resident of Maanyi village. I am married and a father of 4 children. In 2020, when there was the Covid-19 outbreak, our work was put on halt since all the schools were closed.

Since I was teaching in a private school, that meant no payment. The only alternative income source then was farming, which I never took seriously in my life before. Since I had land, I started farming on 2 acres, where I managed to plant maize and tomatoes. During my first season, I had a big loss on tomatoes because I never had enough knowledge to manage them as required. Even though I had a successful season from maize production, the profit margin was very minimal. Imagine, I invested 758,000 shillings ($205) in a period of 5 months just to earn 1,820,000 shillings ($492), and moreover that was in a good maize season!

After my successful but disappointing maize production season, I was looking forward to trying other crops which could suit my financial demands. During interactions with my fellow community farmers, I was introduced to pumpkin farming by one of the Pumpkin Project beneficiaries who had hosted a demo. Though my first impression about pumpkins was not positive, I used to go there and attend pumpkin production trainings. Through the trainings, I realized that pumpkin production doesn't require as much production and management costs as other crops. I decided to take another farming risk by trying pumpkin on 1 acre, with guidance from the Pumpkin Project extension staff in our community. Through production planning with the expert, I was guided on what is required to produce on an acre and the likely outcome in terms of produce and money.

This was the greatest motivation to take another chance on farming, but this time it was a calculated risk which in the end resulted in a golden fortune. With an investment of 865,000 shillings ($234) on 1 acre under pumpkin production, I managed to earn 5,607,000 shillings ($1,532) in just a period of 4 months. I attribute this success to the quality seeds that I used, which are highly productive, fast maturing, and disease resistant, and above all to the right technical support that I was given. I now plan to expand my field to have 5 acres under pumpkin production, though in staggered phases to always have pumpkins in the market.

**Collected by** Christine Ategeka,
*Technical Field Officer*

## 13.0. PHOTO GALLERY


A technical training on a demo in Mityana district

*A mass pumpkin production awareness campaign on a radio talk show in Lira district*

*Preparing for a Farmer Field Day event on one of the demos*

*A Farmer Field Day event on one of the demos*

*A Farmer Field Day event on one of the demos*

*Loading of adoption farmers' produce by export buyers*

*A practical training session on pest and disease identification and management*

**A practical training session on fertilization**

*A theoretical training session carried out by one of our Technical Field Officers*

*Farmers harvesting the pumpkin leaves, a nutritious and delicious part of the pumpkin plant*

*A technical training at a demo in eastern Uganda*

*A theoretical training session about crop protection and responsible use of agrochemicals*

*A practical training session on responsible use of agro-chemicals*


*One of our Technical Field Officers at a radio talk show in Tororo district*

## 14.0. APPENDIX: REVIEW OF KEY OUTPUTS (JULY 2020 TO JANUARY 2024)

| Activity | Key Performance Indicator | Planned Target | Achieved Target | Notes |
|---|---|---|---|---|
| Establish demos showcasing high-quality pumpkin varieties | Number of quality pumpkin demos established | 480 quality pumpkin demos established | 520 quality pumpkin demos established | 40 more demos were established during the no-cost extension period |
| Train farmers on the best and sustainable pumpkin production practices using the established demos as training centers | Number of farmers trained on the established demos | 7,200 farmers directly trained on the established demos | 14,095 farmers directly trained on the established demos | 6,895 more farmers were physically trained on the established demos |
| Awareness creation about commercial pumpkin production | % increase in number of extensive pumpkin commercial farmers and pumpkin value chain stakeholder engagement | 30% increase in pumpkin production in the project areas | 67% increase in pumpkin production in the project areas | Sustainable market linkages accelerated extensive pumpkin production in the project areas |
| | % increase in pumpkin seed sales | 50% increase in pumpkin seed sales | 73.5% increase in pumpkin seed sales | The increased number of farmers with extensive pumpkin production accounts for the increased quality seed demand and usage |
| Organize Farmer Field Days and engage all the pumpkin value chain actors | Number of Farmer Field Days organized and stakeholders engaged | 250 Farmer Field Days conducted on the established demos | 331 Farmer Field Days conducted on the established demos | 81 extra Farmer Field Days were conducted to further strengthen collaboration among stakeholders |
| Conduct mass media engagement to raise pumpkin production awareness among key value chain actors. | Number of pumpkin production and consumption awareness crop guides shared with stakeholders | 35,000 crop guides printed and distributed for pumpkin awareness creation among key stakeholders | 50,000 crop guides printed and distributed for awareness creation among key pumpkin value chain stakeholders | 15,000 extra crop guides were distributed to different stakeholders during project events to expand pumpkin production and consumption awareness |

| Activity | Key Performance Indicator | Planned Target | Achieved Target | Notes |
|---|---|---|---|---|
| | Number of pumpkin awareness visibility banners placed on the demos | 480 demo visibility signboards placed on demos | 520 demo visibility signboards placed on established demos for awareness creation | 40 extra demo visibility signboards were placed on the extra established demos |
| | Number of radio talk shows conducted | 20 radio talk shows conducted | 26 radio talk shows conducted to raise pumpkin production awareness among stakeholders beyond the physical project areas | 6 extra radio talk shows were conducted in collaboration with other stakeholders |
| | Number of news articles published | 2 pumpkin production news articles published | 3 news articles published regarding pumpkin production and the impact of the project interventions | 1 more news article was published in collaboration with media partners |
| | Number of social media posts made | 36 social media posts creating pumpkin production and consumption awareness published | 53 social media posts creating pumpkin production and consumption awareness published | 17 more social media posts about pumpkin sector development impact and consumption published |
| Market data collection and sharing with the farmers and market linkages | Frequency of monthly market data sharing | 36 monthly market data reports analyzed and shared with farmers and other value chain stakeholders | 43 monthly market data reports analyzed and shared with farmers and other value chain stakeholders | 7 more monthly market data reports were shared with farmers during the no-cost extension period |
| Pumpkin nutrition awareness campaigns | Number of pumpkin nutrition awareness campaigns conducted | 150 nutrition awareness campaigns conducted | 173 nutrition awareness campaigns conducted | 23 more pumpkin nutrition awareness campaign sessions were conducted |

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