



Semilla Nueva

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# STANDARD REPORT

SECOND SEMESTER  
JANUARY – JUNE 2024



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## **Semilla Nueva Standard Report Second Semester January – June 2024**

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## LETTER FROM THE DIRECTOR

Semilla Nueva finds itself at the most significant inflection point in the history of the organization. The Salvadoran and Guatemalan governments are exploring significant biofortified seed distributions and subsidy support, potentially reaching over 100,000 farmers in the next two years. A \$4.5M USAID project, which will help fund the Guatemalan subsidy and support the Guatemalan government in implementation, is close to being signed. We've pinpointed the most impactful subsidy amount to trigger companies to expand production and promotion of our new biofortified seeds. We're achieving technical breakthroughs that will halve the cost to convert a seed to biofortified. Our progress with gene editing is underway and could offer a pathway to making seed conversion so fast and inexpensive that governments could simply mandate widespread biofortification, improving the nutrition of hundreds of millions of people. We've begun work on expanding to Sub-Saharan Africa, and just last week began converting One Acre Fund's most important new seeds for Rwanda at our farm in Guatemala. All of this progress is being supported by results from our first nutrition RCT, with two other RCTs underway on nutritional impact and our subsidy design.

**Table 1: Historic and Potential Farmers Reached 2021-2027**

	2021	2022	2023	2024	2025	2026	2027
Guatemala Subsidized Sales	9,659	12,275	14,738	23,912	36,375	53,641	75,175
Guatemala Seed Handouts	3,004	5,865	4,221	4,300	31,400	33,050	34,600
Guatemala Replanting Farmers		2,365	5,712	4,000	6,280	6,610	6,920
El Salvador Subsidized Sales					2,464	7,920	14,520
El Salvador Seed Handouts				1,550	3,520	3,520	3,520
Subsidized Sales Honduras						2,200	4,400
<b>Total</b>	<b>12,663</b>	<b>20,505</b>	<b>24,671</b>	<b>33,762</b>	<b>80,039</b>	<b>106,941</b>	<b>139,135</b>

The metrics above represent the opportunities that Semilla Nueva has in front of it right now, given potential collaborations with the Guatemalan and Salvadoran governments and interest in seed companies in both countries. Meeting these goals is not guaranteed. It will require making some critical hires, investing in significantly more parental seed, improving our support to other seed companies, improving our internal processes, and protecting our culture while we do all of this.

Semilla Nueva could cut the cost per family by close to fourfold over the next three years, while producing enough biofortified maize to begin to affect undernutrition at the national level in Guatemala. We won't be able to do it alone and we would love any leads on partners who may be interested in this big opportunity and in providing the support and mentoring to do it well. To all of you who have supported us on this journey so far, we hope you are just as excited as we are.

Thanks for making it possible,

-Curt



## EXECUTIVE SUMMARY

### Subsidized Seed Sales

- Semilla Nueva and other seed companies sold out of seed within 12 weeks. With seed currently in production, we expect sales will increase 63% over 2023.
- 1,213 farmers attended 34 field days promoting the seeds produced by all participating seed companies. Semilla Nueva launched a TikTok channel dedicated to *Maíz de Poder*, which reached more than 200,000 views in its first two months.
- Semilla Nueva's production farmers and third-party seed companies fell short of their production goals by 33% and 40%, respectively, largely due to environmental factors affecting the region. We are developing an action plan to minimize losses in the future.
- In El Salvador, following a pilot project using seeds produced in Guatemala, two seed companies are preparing for their first production and subsidized sales of 1,500 bags.

### Institutionalizing the Subsidy

- In Guatemala, USAID has begun preparing a contract for a grant that would fund a third-party program to design, oversee and finance a national seed subsidy for biofortified seeds.
- The Guatemalan government created a pilot project to provide F7 seeds to 2,500 families in 100 of Guatemala's 340 municipalities. Semilla Nueva partnered with leading Guatemalan congresspeople to provide F7 seeds to an additional 1,800 farmers in their districts.
- In June 2024, Semilla Nueva helped draft the Guatemalan Ministry of Agriculture's plans for food self-sufficiency. The administration is considering funding half of our subsidy.
- After two years of testing, the Salvadoran government will launch Semilla Nueva's F5 seed as NB-H24. Our seeds were provided to 1,550 Salvadoran farmers in May 2024.
- The Salvadoran government has drafted an agreement to pilot our subsidy program in El Salvador.

### Developing Better Seeds

- Semilla Nueva is fast-tracking the creation of four new biofortified hybrids with higher yields and more resilience for seed company production in heat waves. This strategy will allow sales of 5,000-10,000 bags of new hybrids by 2026 and 20,000-40,000 bags by 2027.
- We are implementing our first marker-assisted selection strategy. Combined with our new dryer this strategy should allow us to reduce the time and cost to convert a new hybrid to be biofortified from \$450,000 over 5.5-7 years to \$220,000 over 3.7 years.
- Semilla Nueva's gene editing project with the University of Wisconsin is underway. 13 genes are being tested for their ability to increase zinc, iron, and protein quality without negative consequences such as lower yields. Initial results will be available in mid-2025.
- One Acre Fund sent us the most important seeds they've already launched in Rwanda and plan to launch in the coming years. The first cycle of backcrossing is underway at our farm.



## **Impact**

- Semilla Nueva has reached 20,154 farmers in the first half of the year, including 1,500 farmers in El Salvador. We expect to reach 30,000 farmers by the end of the year.
- Results from Semilla Nueva's first nutrition Randomized Controlled Trial (RCT) showed that consumption of biofortified maize for four months led to a significant improvement in zinc status in women and children, measured by the new biomarker, LA:DGLA ratio.
- We've begun a Bioavailability Randomized Controlled Trial (RCT) to quantify the total absorbed zinc (TAZ) and the total absorbed iron (TAI) from biofortified maize in children.
- We are wrapping up our initial subsidy design RCT whose key learnings are guiding a focused and scaled-up 2025 RCT. The results will allow us to produce cost-benefit ratios for different subsidy designs and their impact on farmers.

## **Funding, Administration, People**

- Semilla Nueva received \$2,078,862 in new grants, renewals, and individual donations, and \$1,263,707 in additional funding commitments from January-June 2024.
- Seven larger funders renewed their support for a total of US\$2,564,979. Four funders increased their support from US\$275,000 in 2023 to a total of US\$570,000 in 2024.
- We expanded our 2024 budget from US\$4.9M to US\$5.4M (a 10% increase) to meet the demands of Semilla Nueva's growth towards scale.
- Cash-on-hand and committed funding cover 99% of the 2024 adjusted budget. Likely renewals and awards would extend our cash flow runway to eight months.
- We successfully implemented US-GAAP standards for nonprofits.
- Our External Audit report was issued with no major findings.
- We hired ten employees in the last six months, including a Chief Strategy and Impact Officer, a Research and Learning Director, and a Gene Editing Lead. Our headcount stands at 55.
- We continue to recruit for a COO, Finance and Human Resources Manager, and Production Coordinator.



## CONTEXT AND KEY TERMS

### Semilla Nueva's Strategy

Malnutrition rates are decreasing globally, but for the 1.2B people who eat maize three times a day, the number of malnourished children is still on the rise. This population is fed by 53M smallholder farmers in Sub-Saharan Africa and Mesoamerica. Most are extremely poor and use low-quality maize seeds with low nutritional content. Almost none grow more nutritious, biofortified maize.

Three market failures prevent farmers from adopting higher-yielding biofortified seeds at scale:

- 1) Consumers and farmers won't pay more for nutritious maize, preventing seed development.
- 2) Without subsidies, most poor farmers cannot afford any new, high-yielding seeds.
- 3) Without a strong market, local seed companies don't develop and market new, higher-yielding or biofortified seeds.

Semilla Nueva's solution is to:

- 1) Develop high-yielding, more nutritious biofortified seeds, using techniques to make it cheap for all seed companies, including larger transnationals and governments to develop their own.
- 2) Pilot subsidies for companies enabling them to sell new, high-yielding biofortified seeds at affordable prices.
- 3) Work with governments to institutionalize these subsidies.

### Maize market

In Guatemala, our goal is for more than half of the maize consumed to be biofortified. We plan to reach this goal by getting more farmers to use our seed and increasing their yields so they produce more of the maize consumed in Guatemala. The table and descriptions below provide an overview of the structure of the maize market in Guatemala, the types of farmers, and their contribution to annual maize consumption to contextualize the number and type of farmers who will need to use our seed to reach this goal.

**Table 2: Semilla Nueva estimate of Guatemala's maize market and maize farmer structure**

Farmer Segment/Source	Hectares	Farmers	Average Yield (mt/ha)	Total Annual Production (mt)	% of Annual Consumption
Non-hybrid high elevation	157,990	320,000	2.6	410,364	19.2%
Non-hybrid low-mid elevation	315,000	550,000	2.3	715,909	33.5%
Low-segment hybrid	56,000	80,000	3.6	200,000	9.4%
Mid-segment hybrid	28,000	40,000	3.9	109,091	5.1%
High-segment hybrid	56,000	40,000	5.2	290,909	13.6%
Imported illegally from Mexico	0			409,091	19.2%
<b>Total</b>	<b>612,990</b>	<b>1,030,000</b>		<b>2,135,364</b>	<b>100.0%</b>



**Non-hybrid farmers** do not purchase seed annually, but instead save and replant seeds saved from their previous harvests. These farmers typically use a limited amount of chemical fertilizer, herbicides, and seed treatment, which they purchase each year. Most only grow enough maize for home consumption, but some have large enough land holdings to produce enough maize to sell to the market. We estimate the 870,000 farmers who do not purchase seed produce 53% of the maize consumed in Guatemala<sup>1</sup>. Our current seeds are suitable for farmers in the low and mid-elevations (0-1,800 MASL), but seeds have not yet been developed for higher elevation regions in Guatemala.

**Low-segment farmers** purchase cheap but low-yielding hybrid seeds produced by local companies. The seeds cost ~US\$45 per 20kg bag and provide farmers with only slightly higher yields than non-hybrid seeds. We estimate 80,000 low-segment farmers produce 9% of Guatemala's maize.

**Mid-segment farmers** use moderately priced seeds produced and sold by national Guatemalan companies. The seeds cost ~US\$71 per 20kg bag but only provide moderate yields. We estimate 40,000 mid-segment farmers produce 5% of the maize consumed in Guatemala.

**High-segment farmers** purchase the most expensive hybrid seeds from transnational seed companies every year. The seeds cost ~US\$150 per 20kg bag but provide farmers with high yields. We estimate 40,000 high-segment farmers produce 14% of the maize consumed in Guatemala.

### **Breeding terms**

**Pure lines:** Pure lines are seeds bred to be genetically homogeneous. They have specific traits (yield, nutrition, disease resistance, etc.) and are similar from generation to generation.

**Hybrids:** Most commercial maize seeds are hybrids. They result from pollinating one pure line with another. Commercial hybrids<sup>2</sup> generally have been bred for excellent yields and other positive traits. If a farmer buys a hybrid and saves seed from the grain produced, desired traits, such as yield, become less pronounced with each generation. Depending on a farmer's economic and agroecological context, it can be highly advantageous to buy hybrid seed every year (or every few years). Hybrids are not synonymous with GMO. The seeds used to produce hybrids commercially are commonly called parental seeds.

**Seed conversion:** We use the term seed conversion to refer to backcrossing, a process to convert a pure line to have a new trait while maintaining as much of the genetics and desirable performance of the original line as possible. Imagine creating a golden retriever with poodle hair by crossing a golden retriever and a poodle, finding the puppies that are the most like golden retrievers but with full poodle hair. In the next generation, you cross those puppies with a golden retriever and pick the puppies that are even more like golden retrievers but still have poodle hair, etc. After several generations, you may have a few golden retrievers with poodle hair. Semilla Nueva backcrosses (or converts) the lines of high-yielding hybrids to have improved nutritional traits while maintaining their yield.

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<sup>1</sup> In 2020, the Guatemalan government estimated 20% of maize is imported illegally from Mexico. In our model we estimate 17%.

<sup>2</sup> If a (simple) hybrid is itself crossed with another line or another hybrid, it forms a triple or double hybrid. Most commercial seeds in Sub-saharan Africa and Mesoamerica are triple or double hybrids.



## SUBSIDIZED SEED SALES

### Doer at Scale

#### Summary

- Demand for biofortified seeds was high in Guatemala during the first half of 2024, with Semilla Nueva and other seed companies selling out within 12 weeks.
- With seed currently in production, sales in Guatemala should reach 12,515 bags, representing 10% of all seed sold in the country and a 63% increase over 2023.
- Our efforts to shift from promoting our seed brand, *Fortaleza*, to one that covers all biofortified seeds and companies, *Maíz de Poder* (Corn of Power), has achieved initial success, with all partner seed companies participating. 1,213 farmers attended 34 field days promoting the seeds produced by all participating seed companies. Semilla Nueva launched a TikTok channel dedicated to *Maíz de Poder*, which reached more than 200,000 views in its first two months.
- In Guatemala, our biggest challenge has shifted from creating demand for new biofortified seeds to reaching production goals. Semilla Nueva’s production farmers and third-party seed companies fell short of their production goals by 33% and 40%, respectively, largely due to environmental factors that affected seed production throughout the region. We are developing an action plan to address these problems and minimize losses in the future, with additional production planted.
- In El Salvador, following a pilot project using seeds produced in Guatemala, two seed companies are preparing for their first production and subsidized sales of 1,500 bags.
- In Honduras, the seed registration process is underway, and two companies are interested in beginning production in 2025 and sales in 2026.

**Table 3: Past and projected sales of biofortified seed (20 kg bags)**

20kg bags sold by	2021	2022	2023	2024 YTD	2024 Est.	2025*	2026*
<b>Semilla Nueva</b>	<b>3,637</b>	<b>5,213</b>	<b>5,688</b>	<b>5,933</b>	<b>7,548</b>	<b>9,250</b>	<b>8,850</b>
<b>Other seed growers</b>	<b>1,129</b>	<b>2,005</b>	<b>1,993</b>	<b>1,440</b>	<b>4,966</b>	<b>11,850</b>	<b>21,150</b>
Valle Verde	1,129	2,005	1,627	865	2,910	5,000	6,000
Semillas del Trópico	0	0	279	305	305	1,000	1,250
Agropher	0	0	0	270	1,432	2,500	2,500
PASFESA	0	0	0	0	49	1,000	1,500
Disagro	0	0	0	0	0	2,000	3,250
Zacapa	0	0	0	0	0	350	750
Taiwan	0	0	0	0	0	0	5,000
Atescatel	0	0	0	0	0	0	450
Other seed growers	0	0	87	0	0	0	450
<b>TOTAL</b>	<b>4,766</b>	<b>7,218</b>	<b>7,681</b>	<b>7,373</b>	<b>12,514</b>	<b>21,100</b>	<b>30,000</b>

\*estimates



There was strong growth in farmer demand for our seed during the first half of 2024, with Semilla Nueva and our partner seed companies selling out within 12 weeks of placing seed on the market. Both seed companies and Semilla Nueva's primary hindrance in sales was a lack of seed production. Semilla Nueva also diverted nearly 2,000 bags of seed destined for commercial sales to unplanned collaborations with the Guatemalan and Salvadoran governments (see *Institutionalizing the Subsidy*, page 14). All seed companies and Semilla Nueva's distributors reported high demand and significant shortfalls in inventory, making increased seed production the most important priority for the operations team over the next year.

### Seed companies have embraced the *Maíz de Poder* brand bolstered by Tiktok, reaching 282,400 views in five weeks

In early 2024, we began transitioning our promotional activities from our seed brand, *Fortaleza*, to an umbrella brand, *Maíz de Poder*, promoting the nutritional value of biofortified seeds and the seed subsidy. Ultimately, we sought to help farmers understand that multiple seed companies sell similar biofortified seeds under different brands and to build farmer identification and advocacy for the subsidy program. The rollout was successful. Semilla Nueva transitioned all branding at agrodealers, on staff uniforms, and during field days to *Maíz de Poder*. Semilla Nueva's demonstration parcels included seeds and logos from all participating seed companies under the *Maíz de Poder* banner. By June, these field days reached 1,213 farmers in 34 locations. All partner seed companies included *Maíz de Poder* logos on their seed bags and expressed appreciation for the additional publicity provided to their companies. We will evaluate farmer identification and perceptions of the brand in our end-of-year survey.



One notable new strategy was the use of TikTok. We launched our [account](#) in late May and received 282,400 views, 4,199 likes, and 1,144 followers within five weeks, far exceeding our expectations. Videos showcasing farmers using our seeds in the field were the most successful, while more traditional promotional videos or Q&A videos with the staff were less popular. Our TikTok audience is 86% male and 14% female, with most followers falling within the 23 to 34 age range. 79.2% of viewers are from Guatemala, 5.4% from the US, 5.2% from El Salvador, and the remainder from Mexico and Honduras.

**Figure 1: Official TikTok feed of Maíz de Poder**

The video with the highest engagement had 313 comments, 63% positive, including “Where can I buy or get the seeds?”; “Please, more information; I need these seeds!”; “What hybrid is it?”; “Those ears look good; that corn will yield well.” 37% of comments, however, expressed concerns from viewers such as “Transgenic corn”; “Stop lying, Monsanto in disguise”; “You have to buy these seeds every year; it's better to use heirloom seeds.” We're working to develop a strategy to provide links to



information, light-hearted responses, and respond to some of the most important misconceptions about biofortified seeds.

**Seed companies experienced the most difficult year of production in recent memory. Heat waves combined with an outbreak of a pest cut production by 40-70% for conventional and biofortified seeds alike**

Extreme heat made the most recent primary seed production cycle (October to April) the worst in recent memory for seed companies throughout the country. The largest local seed company suffered losses of 50-80% for their conventional, non-biofortified seeds, while the two next largest companies lost 40% of their projected production. In addition to high temperatures, previously undocumented increases in pest populations contributed to significant crop losses. These factors also affected biofortified seed production. Semilla Nueva’s production farmers reached an average of 72% of production goals, while other seed companies producing biofortified achieved only 60% of seed production targets.

To compensate for these losses, Semilla Nueva and two partner seed companies initiated additional seed production during the rainy season—a practice that resulted in losses in 2023. To obtain better results this year, we began production 2-3 months earlier in the rainy season and employed improved management practices.

**Table 4: Current and planned seed production (hectares and 20 kg bags)**

Seed company	Planted and harvested (ha)	44 lbs bags produced YTD	Currently in production (ha)	Additional bags estimated
<b>Semilla Nueva</b>	<b>72.80</b>	<b>5,933</b>	<b>15.75</b>	<b>1,615</b>
<b>Other seed growers</b>	<b>17.50</b>	<b>1,440</b>	<b>36.30</b>	<b>2,814</b>
Valle Verde	10.50	865	21.00	1,739
Semillas del Trópico	4.20	305	0.00	0.00
Agropher	2.80	270	14.70	1,026
PASFESA (new)	0.00	0.00	0.60	49
<b>TOTAL</b>	<b>90.30</b>	<b>7,373</b>	<b>51.45</b>	<b>4,429</b>

We are developing strategies and practices to enable Semilla Nueva and our seed company partners to sustain high seed production yields despite increasingly extreme weather conditions and pest infestations. These new approaches and recommendations will offer an additional advantage to seed companies choosing to produce biofortified seeds. The first table below categorizes the losses experienced by Semilla Nueva and our partner seed companies into three types: 1) losses that would not have occurred with adherence to best practices, 2) losses that can be mitigated with improved recommendations and practices, and 3) losses that are currently unavoidable with our existing seeds. The second table summarizes potential solutions.



**Table 5: Production Shortfalls**

Seed	ha	Planned yield (mt/ha)	Actual yield (mt/ha)	Loss	Preventable with existing recommendations (% of loss attributable)	Preventable with additional recommendations (% of loss attributable)	Unpreventable (% of loss attributable)
<b>Semilla Nueva</b>	<b>72.80</b>	<b>2.39</b>	<b>1.71</b>	<b>28%</b>			
F5 9 sites	18.90	2.80	1.26	55%	- Plant density (6%) - Synchronization of flowering (6%)	- Spiroplasma (40%) - Other diseases/pests (9%)	Temperatures & Pollen viability (39%)
F7 30 sites	53.90	2.31	1.82	21%	- Plant density (10%) - Synchronization of flowering (18%)	-Spiroplasma (12%) -Other diseases/pests (18%)	Temperatures & Pollen viability (42%)
<b>Other seed growers</b>	<b>17.50</b>	<b>2.77</b>	<b>1.66</b>	<b>40%</b>			
Valle Verde (F5)	10.50	2.80	1.65	41%	- Plant density (10%) - Synchronization of flowering (5%) - Fertilization (20%)	-Spiroplasma (33%) -Other diseases/pests (5%)	Temperatures & Pollen viability (27%)
Semillas del Trópico (F5)	4.20	2.80	1.45	48%	- Plant density (5%) - Synchronization of flowering (2%) - Fertilization (5%)	-Spiroplasma (8%) -Other diseases/pests (5%)	Temperatures & Pollen viability (75%)
Agropher (new grower) (F7)	2.80	2.31	1.93	16%	- Plant density (5%) - Synchronization of flowering (23%) - Fertilization (5%)	-Spiroplasma (5%) -Other diseases/pests (12%)	Temperatures & Pollen viability (50%)
<b>TOTAL</b>	<b>90.30</b>	<b>2.53</b>	<b>1.70</b>	<b>33%</b>			



**Table 6: Solutions**

Seed	Description	Planned Solution
<b>Preventable Factors</b>		
Planting densities	42-69% of the area produced by SN and 17-44% produced by other seed companies had the optimal number of plants per hectare. Failure to follow recommendations resulted in lower-than-expected germination rates of the seeds provided by Semilla Nueva.	<ol style="list-style-type: none"> <li>1. SN will be present during planting and will not provide parental seeds ahead of time to ensure farmers follow recommendations.</li> <li>2. SN will hire a third production coordinator.</li> <li>3. Our new head of operations, Alejandro Cruz, is developing a field handbook, mandatory training sessions, and educational videos on critical activities.</li> <li>4. We will improve the quality control of basic seed production.</li> </ol>
Flowering synchronization	Our production team and farmers did not follow the recommendations provided by Semilla Nueva's R&D team regarding planting times for male and female plants for F7. As a result, female plants were not optimally pollinated by male plants, leading to lower production.	
Fertilization	Valle Verde applied less than half the recommended amount of fertilizer.	<ol style="list-style-type: none"> <li>1. SN will provide soil testing and fertilizer recommendations to interested partners.</li> </ol>
<b>Preventable factors with extra steps</b>		
Spiroplasma	Transmitted by the leaf hopper, <i>Dalbulus maidis</i> , this disease became the primary source of losses in Guatemala for the first time in 2024. This pest has been South America's leading source of crop loss for several years.	<ol style="list-style-type: none"> <li>1. Insecticide applications 6-12 times per crop cycle, instead of three at a cost of \$120 per application. SN will provide some support for farmers to test this practice.</li> <li>2. Seed production must take place in the October-December cycle.</li> </ol>
Other diseases	Several common diseases were also present, causing losses for a small number of production parcels.	<ol style="list-style-type: none"> <li>1. Training for the production team.</li> <li>2. Hiring a third production coordinator.</li> </ol>
<b>Non-Preventable Factors</b>		
Temperature spikes	Temperatures ranged from 2-4°C above normal ranges.	<ol style="list-style-type: none"> <li>1. Semilla Nueva's R&amp;D team is developing biofortified seeds with better pollen production for sales in 2026.</li> <li>2. Semilla Nueva's team will recommend planting in areas with lower heat stress and access to irrigation.</li> </ol>
Pollen viability in high temperatures	Temperatures higher than 38-40°C affect pollen production of F5 and F7 more than other hybrids, requiring improved biofortified seeds.	



We are piloting most of the recommendations described above with our seed production partners in this current cycle.

Implementing these strategies across seed producers will require additional staffing. In February, we hired an experienced Operations Director, Alejandro Cruz, who created a new system for tracking staff visits to seed producers to monitor planting densities, pest control, irrigation, and other controllable factors. Additionally, we are recruiting a third seed production coordinator for Northern Guatemala, a 12-hour drive from most of our operations and the area where we anticipate most new seed production will occur. To further streamline operations, we are consolidating seed production onto fewer, larger farms, which will facilitate more frequent visits by our team to each producer.

### **El Salvador and Honduras**

#### **Two Salvadoran companies plan to produce 1,500 bags for sales in 2025**

With the Salvadoran government planning an official launch of our hybrid F5 as NB H-24 in August of 2024 and discussions underway to launch our subsidy program with the Salvadoran government, (see *Institutionalizing the Subsidy*, page 16), several seed companies are preparing to produce biofortified seed for sales in 2025.

Villavar is the most respected Salvadoran maize seed company, with the highest local production. Historically, most seed production in El Salvador has been sold directly to the government for seed handout programs. However, Villavar has produced primarily for sale directly to farmers and has strong connections to the largest agrodealer network in the country. Villavar has participated in field days held by the Salvadoran government and our team and has decided to begin a pilot production of approximately 500 bags for subsidized sales in 2025.

The second seed company is ACOPAI, a farmer cooperative that previously sold primarily to the government and less directly to farmers. ACOPAI will produce approximately 1,000 bags for sale in 2025.

We are also negotiating with several other seed companies. A notable example is DIAGRI, the leading distributor for several of the region's biggest agricultural input companies such as Yara and Syngenta, and several hybrids from Guatemala. Like Agrofer in Guatemala, DIAGRI is interested in beginning its own seed production, given scarcity of high quality, affordable seeds in El Salvador.

#### **Seed registration is underway in Honduras, with seed companies interested in sales in 2026**

In early 2024, Semilla Nueva hired a consultant to plant 15 test plots with the Honduran government. Following a second season of testing this year, F5 and F7 seeds should be registered in Honduras by mid-2025. We anticipate promoting these seeds in May 2025 in partnership with Catholic Relief Services. Existing seed companies such as Red-PASH (Network of Artisan Seed Producers of Honduras) and Zamorano University will likely produce the seeds. As in El Salvador and Guatemala, agricultural input companies, such as Cadelga, have expressed interest in expanding from seed distribution into seed production.



## INSTITUTIONALIZING THE SUBSIDY

### Payer at Scale

#### Summary

- After submitting a final technical application in March 2024, USAID has begun preparing a contract for a grant that would fund a third-party program to design, oversee, and finance a national seed subsidy for biofortified seeds.
- The Guatemalan government created a pilot project to provide F7 seed to 2,500 families in 100 of Guatemala's 340 municipalities. Through this collaboration, we trained 275 government extensionists to promote biofortified seeds and provide farmers with technical support, and established 100 monitoring parcels on which the government can collect impact data. We reached all target families with seeds in less than three weeks.
- In addition to collaborating with the executive branch, Semilla Nueva partnered with leading Guatemalan congresspeople to provide F7 seeds to 1,800 farmers in their districts.
- In June 2024, Semilla Nueva was invited to help draft one of the Guatemalan Ministry of Agriculture's four main plans for food self-sufficiency. This plan proposes expanding the seed handout program with high-yield biofortified seeds and increasing Semilla Nueva's seed subsidy. The administration is considering funding half of the subsidy if it can benefit more farmers and is exploring sourcing half of the seeds from local seed companies.
- After two years of testing, the Salvadoran government will launch Semilla Nueva's F5 seed as NB-H24. In May 2024, 1,550 Salvadoran farmers received our seeds—550 of whom produce maize for the Ministry of Education's nutritious school drink, Biofortik. NB-H24 will be officially launched in El Salvador in August 2024.
- The Salvadoran government has drafted an agreement to pilot our subsidy program in El Salvador. The government will determine subsidy amounts and conditions, and Semilla Nueva will pay seed companies for the first two years.

#### USAID Grant for Guatemalan subsidy enters final stages

In 2023, Semilla Nueva and USAID collaborated on a co-creation process for a \$4.5M fixed amount award to support seed development and a national pilot of our subsidy program with the Guatemalan government. USAID invited Semilla Nueva to submit a final technical application in March 2024, and we have submitted three proposal revisions. USAID has begun preparing a contract, which, if agreed upon by all parties, could lead to a project launch in the coming months. This grant will fund a significant portion of the seed subsidy in the next three years and provide support to create a third-party subsidy mechanism, which would later be funded directly by the Guatemalan government.

#### Guatemalan government launches pilot distribution and study of F7

The new Guatemalan administration began in January 2024 and has been very receptive to biofortified seeds. To test Semilla Nueva's seeds, the government created a pilot project to provide seed to 2,500 families in 100 of Guatemala's 340 municipalities. The pilot also tested a new strategy for distributing seeds. Typically, the Guatemalan government brings all seeds to a central location before transporting them to departmental headquarters and then to municipalities. The process often takes 2-3 months, leading to seeds damaged by heat and humidity and frequently arriving after farmers have planted. Semilla Nueva worked with the government to develop a strategy for Semilla Nueva to deliver seeds directly to municipal offices where farmers could retrieve them often on the same day. This new



process led to the most successful seed handout program the government has implemented, reaching all target farmers in less than three weeks.

Semilla Nueva provided eight training sessions to 275 government extensionists prior to seed delivery. These sessions covered the benefits of our biofortified seeds, provided impact data, and shared farmer testimonials.

In coordination with the University of Chicago's Development Innovation Lab (DIL), Semilla Nueva and the Ministry of Agriculture adjusted our existing monitoring and evaluation system to address questions of the government, including those concerning post-harvest damage. The government agreed to establish 100 monitoring parcels—one in each municipality where pilot participants planted F7 and their usual seeds side-by-side. Semilla Nueva will accompany government extensionists on visits to 40 of these parcels and will provide fuel vouchers to facilitate extensionists' visits to the remaining 60 parcels. DIL led the strategy for farmer selection, and the first visits are underway.

### **Semilla Nueva partners with Guatemalan congresspeople to reach 1,800 farmers**

In addition to collaborating with the executive branch, Semilla Nueva's team of political advisers and policy experts led an initiative to work with leading congresspeople from the major political parties to test F7 in their districts. In May and June, congresspeople and local mayors held events where Semilla Nueva trained farmers on the new seeds and provided seeds to 1,800 farmers. In late 2024, Semilla Nueva will coordinate visits to monitoring parcels where members of Congress can observe the seeds' impact in person.

### **Semilla Nueva assists the Guatemalan government in writing a plan for maize self-sufficiency, including a role for subsidy**

In June 2024, Semilla Nueva was invited to help draft one of the Guatemalan Ministry of Agriculture's four main plans for food self-sufficiency. The share of staple crops imported to Guatemala has increased steadily over the last 20 years, and the new administration has tasked the Ministry of Agriculture with reversing this trend, with a primary focus on maize. The first draft of this plan, currently under ministerial review, proposes expanding the seed handout program with high-yield biofortified seeds and increasing Semilla Nueva's seed subsidy. The administration is considering funding half of the subsidy if it can benefit more farmers and is exploring sourcing half of the seeds from local seed companies.

Beyond the significant wins for biofortified maize, the plan also has provisions to 1) discontinue purchases of low-performing seeds that have been in the market for decades, 2) allow seed companies to provide seeds directly to municipal offices (based on the success of Semilla Nueva's seed handout partnership in May 2024) and 3) use Semilla Nueva's monitoring and evaluation system to estimate the total income and yield benefits from the program. In the past, the Ministry of Agriculture measured its impact based on the amount of seed handed out and the number of training events delivered. Semilla Nueva is helping to establish a new system of metrics based on increased yields and incomes, which will allow the new government to demonstrate the impact of its new policies on the population, and will identify seeds that the government should no longer distribute due to low yields.

Semilla Nueva sees this close collaboration with the Guatemalan government as its biggest current opportunity and is prioritizing resources accordingly. This collaboration could double our goals for



farmers reached with biofortified seed over the next three years and offers a faster path to program sustainability than we originally imagined. However, additional staff and support from our donors are needed to make it possible.

## EL SALVADOR

### **The Salvadoran government registers F5 as NB-H24 and prepares for launch in August 2024**

After two years of testing, the Salvadoran government will launch Semilla Nueva's F5 seed as NB-H24. The seed is the first to be launched with a new government naming system that will be used for all future seeds. It begins with the president's initials (NB for Nayib Bukele), followed by an 'H' for hybrid and '24' for the year the seed is released. The official launch will take place in late August 2024 on a farm where Semilla Nueva donated the seed in May, with several hundred farmers participating.



**Figure 2: Official logo of El Salvador's launch of F5 as NB-H24, with Maíz de Poder logo**

### **The Salvadoran government provides NH-H24 to 1,550 farmers in May 2024 with results to be evaluated in collaboration with the University of Chicago's DI**

In May 2024, Semilla Nueva successfully imported biofortified seed into El Salvador for the first time. The seed was provided to 1,000 farmers for testing throughout the country and 550 farmers who produce maize for the Ministry of Education's nutritious school drink, *Biofortik*. Biofortik was originally developed to be made with biofortified maize. However, without high enough yielding biofortified maize seeds, farmers refused to produce this key ingredient, and conventional maize was used instead. The Ministry of Education is now coordinating purchases to use their original recipe as part of a program that reaches 350,000 children a year.



**Figure 3: Truck transporting biofortified seed to El Salvador and seed handouts.**

Semilla Nueva trained the government’s technical field staff to use our methodology for measuring farmer yields, incomes, climate resilience, nutrition, and perceptions. The University of Chicago’s Development Innovation Lab led the sampling methodology and farmer selection. The first field visits have already occurred, and field staff is submitting data to Semilla Nueva and the University of Chicago for analysis. By December 2024, we hope to have enough data to consider an academic publication on the results, which has been an attractive prospect to the government.

**The Salvadoran government has begun negotiations on two programs to scale the use of NB-H24: a pilot of Semilla Nueva’s subsidy program and production for an emergency seed reserve**

In February 2024, the government announced it would discontinue its previous program of providing seed and fertilizer directly to farmers and instead provide vouchers to purchase \$200 of agricultural inputs through local agrodealers. This policy change creates several significant challenges. First, few seed companies in El Salvador have experience selling seeds directly to farmers. As a result, much of the seed in the market is high-priced seed imported from Guatemala or multinational companies, often at a cost of \$100-200 for the 25 lbs of seed farmers typically purchase. While the government previously handed out both seed and fertilizer, the \$200 voucher would not be enough to cover both inputs at market rates. Finally, the government has not launched newer, higher-yielding seeds in over a decade—meaning even if seed companies sought to expand production to meet the new opportunity, they lack access to newer seeds to produce.

The government has identified Semilla Nueva’s program as a potential solution to these problems. Semilla Nueva is assisting the government in testing and launching newer, higher-yielding seeds and supporting seed companies in producing these seeds. Our subsidy increases the profitability of seed companies, and the subsidized price means that farmers could use their vouchers to purchase both seeds and fertilizer.



The Salvadoran government and Semilla Nueva negotiated the outline of an agreement to build an official subsidy committee to manage a new subsidy program, with Semilla Nueva pledging to provide funding for the first two years. The agreement has passed legal revision from the government's research and development branch and is presently under revision by the Ministry of Agriculture. The plan is to approve the committee and use it to launch the first subsidized production of biofortified seed with at least two partner seed companies in late 2024 for sales in 2025. While the government has discussed the desire to reach 100,000 farmers within two years, Semilla Nueva has advised a more cautious approach to scaling the program due to our own financial constraints and to avoid growing too quickly with local seed companies.

**Table 7: Projected sales of biofortified seed (20 kg bags)**

20kg bags sold by	2024 Est.	2025*	2026*
Villavar	0	1,000	1,000
ACOPAI	0	400	1,500
Donated seed	427	0	2,000
<b>TOTAL</b>	<b>427</b>	<b>1,400</b>	<b>4,500</b>

\*estimates

To prepare for providing assistance to seed companies, the government also completed two pilot productions of NB-H24. The pilots were successful, with yields reaching 3.57 mt/ha, higher than the average production of Semilla Nueva farmers and seed companies in Guatemala. Seed companies were invited to several field days to observe seed production, leading to their initial agreement to produce seed later this year.



**Figure 4: Seed production trials and 100% germination rate in harvested seeds**



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In addition to the subsidy program, the Salvadoran government is discussing the creation of a strategic reserve of seed. Given climatic events and the weakness of the local seed sector, government handouts of seed may be necessary in 2025, and NB-H24 is being discussed as the primary candidate. The government would produce seed with its own funds, with Semilla Nueva providing parental seed. Enough seed could be produced to reach 5,000-10,000 farmers in 2025.



## DEVELOPING BETTER SEEDS

**Making farmers and seed companies more money—and the subsidy cheaper**

### Summary

- Semilla Nueva is fast-tracking the creation of four new biofortified hybrids with higher yields and more resilience for seed company production in heat waves. This strategy will allow sales of 5,000-10,000 bags of new hybrids by 2026 and 20,000-40,000 bags by 2027.
- We are implementing our first marker-assisted selection strategy, using markers for the genes for zinc and protein quality to increase the speed and decrease the cost of converting hybrids to be biofortified. Combined with our new dryer this strategy should allow us to reduce the time and cost to convert a new hybrid to be biofortified from \$450,000 over 5.5-7 years to \$220,000 over 3.7 years.
- Semilla Nueva's gene editing project with the University of Wisconsin is underway. 13 genes are being tested for their ability to increase zinc, iron, and protein quality without negative consequences such as lower yields. Additionally, the university is growing Semilla Nueva's favorite non-biofortified lines, several of One Acre Fund's target lines, and a new open-pollinated seed for the Guatemalan highlands for sequencing future gene editing efforts. Initial results will be available in mid-2025.
- One Acre Fund sent us the most important seeds they've already launched in Rwanda and plan to launch in the coming years. The first cycle of backcrossing is underway at our farm.

### Fast-track plan to help seed companies beat losses from climate change

Typically, breeding programs spend 2-3 years testing new seeds before spending 2-3 years scaling up production of the parental seed that allows for commercial production. Given the considerable climate-related challenges that seed companies face when producing our current biofortified seeds (as well as their conventional seeds!) Semilla Nueva is utilizing a fast-track strategy to get seeds to seed companies as quickly as possible.

Semilla Nueva has identified four new hybrids that have demonstrated higher yields than F5 and F7 and have parental seeds that are more resilient to heat and pests. We are simultaneously testing these seeds and beginning to reproduce parental seeds. Reproduction of parental seeds is costly, so producing parental seeds for all of our experimental hybrids when we will likely only launch one or two is a trade-off of extra initial financial investment for a quicker launch. With this strategy, we will have new and better seeds for seed companies to test in 2025, allowing for 8,000 bags of production in 2026 (similar to total 2023 production) and 20,000-40,000 bags by 2027 (allowing for a complete replacement of F5 and F7).

### Advances in our farm technology and the use of genetic markers should allow us to decrease the time and cost to convert a new hybrid to be biofortified from \$450,000 over 5.5-7 years to \$220,000 over 3.7 years

Semilla has shown that we can take high-yielding, non-biofortified seeds and convert them to become biofortified. This process takes \$450,000 and 14 generations of corn to complete. Previously, Semilla Nueva was completing 2-2.5 cycles a year. This meant converting a seed required 5.5-7 years. After several years of our own work, combined with a collaboration with Bayer, we are preparing to implement a new strategy that will cut our conversions down to 11 generations at a cost of \$220,000 while improving the likelihood of generating competitive products. This new strategy will combine the



use of genetic markers for nutrition traits with comparing the genes of newly developed lines against their original versions (background selection). This genetic screening will cost an estimated \$90,000 per hybrid, but save us on the genetic screening per hybrid. We can choose only the best materials to advance, allowing us to cut \$120,000 in fieldwork and \$200,000 in our own lab costs. We'll use this new methodology in both new high-yielding seeds for Central America and the new Rwandan hybrids we've obtained from One Acre Fund.

In addition to this new strategy, in 2024 we implemented our new drier systems and other efficiency measures in our backcross program, allowing us to reliably run three cycles per year. Combining these two advances means that the time and cost to backcross a new hybrid seed will fall from \$450,000 over 5.5-7 years to \$220,000 over 3.7 years. We should have confirmation within the next 12 months regarding the accuracy of our initial estimates on the benefits of using our new markers.

### **Our gene editing project, a potential holy grail of biofortification, will show results by mid-2025**

Originally, Semilla Nueva had planned to gain proficiency in the use of genetic markers and then, from knowledge of these genes, work towards gene editing (inserting or activating the genes directly in new seeds). Semilla Nueva's breeding director believed sufficient data and studies were available to justify trying 13 genes already identified as highly correlated to zinc, iron, and protein quality. The potential of the technology is difficult to overstate. If a simple gene editing approach that significantly increases nutrition without impacts to yield is discovered, it could allow us to take any high-yielding seed in the world and make it biofortified in less than a year and for a minimal cost. Further, if these genes naturally occur in maize, this would not be considered GMO in most countries. Even the famously cautious EU approved gene editing as non-GMO in early 2024, as several countries in Latin America and Africa already have. With support from Light a Single Candle and potential support from USAID, Semilla Nueva designed history's most extensive gene editing project for maize (don't give us too much credit, it's a new technology!).

The first round of edits is underway on a common line used for testing in the US, while the University of Wisconsin produces our leading conventional seeds from Central America, leading seeds from Sub-saharan Africa, and an open-pollinated seed from the Guatemalan highlands (a region for which there currently are no biofortified seeds). Our first results of initial edits in our seeds—and results of the improvements in nutrition in their leading seed from all of our target genes—will be available by mid-2025.

### **Semilla Nueva expands to Africa: The conversion of One Acre Fund's leading seeds for Rwanda has begun in Guatemala**

Based on a request from the Rwandan government, One Acre Fund (OAF) is working with local seed companies to develop new seeds, support their sales, and make Rwanda self-sufficient in seed. OAF has validated and launched several new hybrids, with additional hybrids in process. While they are interested in promoting biofortified seeds, there are currently no high-yielding, locally-adapted biofortified seeds available. In April 2024, Semilla Nueva signed an agreement with OAF to receive their current and upcoming seeds and convert them to be biofortified. OAF will then promote these seeds through their programs and partner seed companies. The collaboration is the first step to working with OAF to bring biofortified seeds to the 2-3M farmers they currently support, with low costs for both partners.



**Figure 5: One Acre Fund seeds planted next to Semilla Nueva biofortified seeds for backcrossing at our experimental farm**



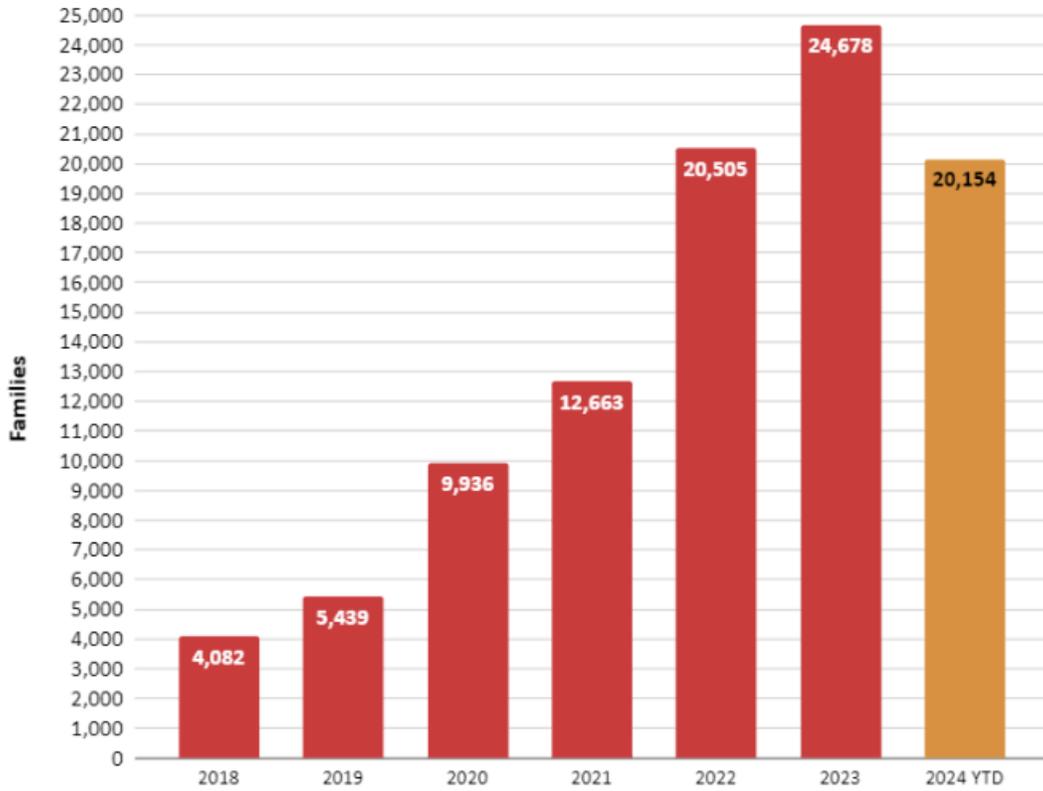
## IMPACT

### Summary

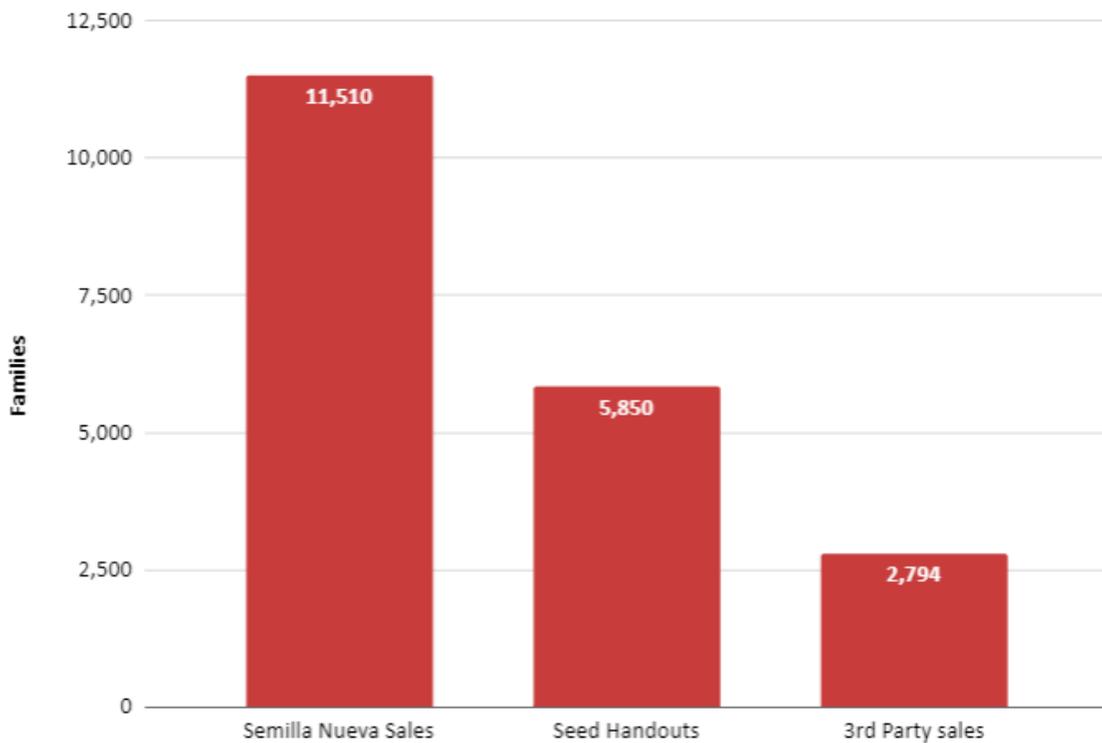
- Semilla Nueva has reached 20,154 farmers in the first half of the year, including 1,500 farmers in El Salvador. We expect to reach 30,000 farmers by the end of the year.
- Results from Semilla Nueva's first nutrition Randomized Controlled Trial (RCT) showed that four months of consumption of biofortified maize led to a significant improvement in zinc status in women and children, measured by the new biomarker, LA:DGLA ratio.
- A group of leading nutrition experts have agreed that a Bioavailability Randomized Controlled Trial (RCT) is the primary study needed to consolidate the evidence base for the nutritional impact of our intervention in Central America. The primary goal of this randomized, double-blind study is to quantify the total absorbed zinc (TAZ) from one day's consumption and the total absorbed iron (TAI) from two days' consumption by schoolchildren from tortillas made with biofortified maize, compared to those made with conventional maize. The study is set to run from July 31 - Nov 20, 2024.
- We are wrapping up our initial subsidy design RCT whose key learnings are guiding a focused and scaled-up RCT for 2025. The research measured 1) how different subsidy models and subsidy amounts impact initial adoption and repurchase rates of biofortified seeds among low-income, smallholder farmers and 2) impacts on the livelihoods, food security, and climate resilience of participating farmers. The collected data will allow us to produce cost-benefit ratios for each subsidy type. Fieldwork is led by Semilla Nueva, with the design, oversight, and publication of results conducted by the Paris School of Economics and University of Chicago's Development Innovation Lab (DIL).

**Semilla Nueva reached 20,154 farmers in the first half of the year, 82% of the farmers reached in 2023. Additional sales and data from replanting farmers will help us surpass 30,000 farmers by the end of the year**

For the first time, our impact graphics now include metrics from El Salvador, with 1,550 farmers in the seed donation category coming from the government's pilot project in 2024.



**Figure 6: Families that planted Semilla Nueva biofortified maize seed (2018 - 2023)**



**Figure 7: Breakdown of families planting biofortified maize in 2023 by source of seed**



## Seed sales and handouts through the Guatemalan government led to coverage of most maize-producing regions in the country

As shown below, the combination of seed sold and seed provided through the pilot project we conducted with the Guatemalan government covered most maize-producing regions in the country, with the exception of high-elevation regions of the Guatemalan Highlands. As shown in Figure 8, our seed is now used in all regions that are net maize exporters, including those that provide the maize consumed in the most malnourished parts of the country. This coverage also allows us to collect national data that can be more convincing to policymakers.

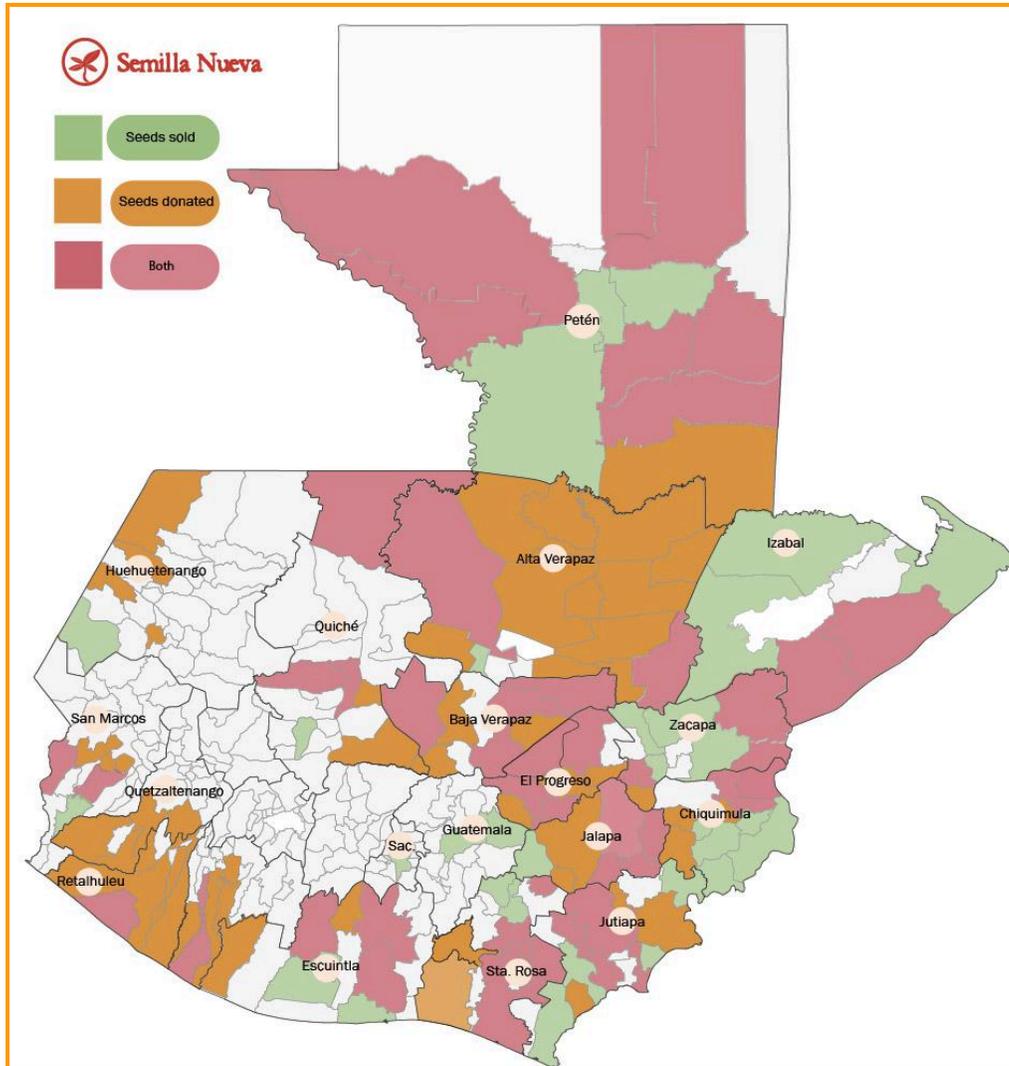
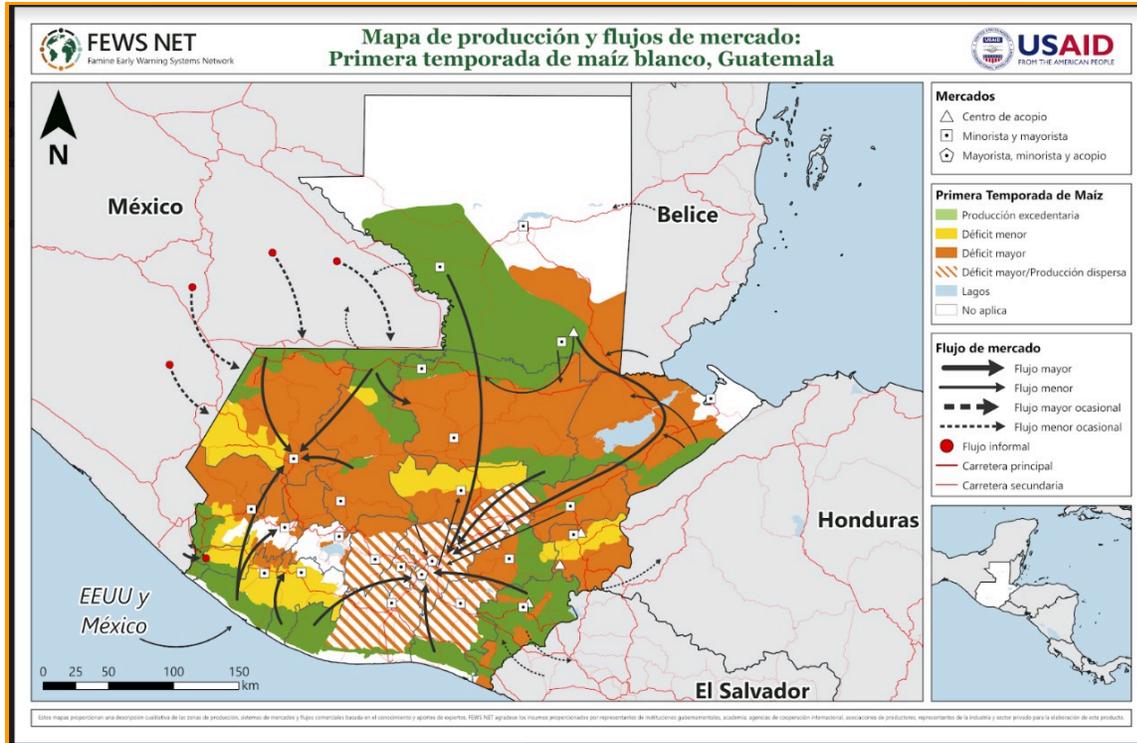


Figure 8: municipalities reached by seed sales, seed donations, or both, Jan-Jun 2024



**Figure 9: FEWS NET overview of maize exporting and importing regions**

**Many farmers purchasing our seed are subsistence farmers, contrary to conventional wisdom**

An analysis of our 2023 annual survey showed that contrary to conventional wisdom, not all farmers who use hybrids are commercial farmers who sell most of their produce, and not all farmers who save seed are subsistence farmers who don't grow enough for home consumption. This has important implications as we think about how to target farmers and which farmers to prioritize for economic and nutritional outcomes.

**Table 8: Use of maize by farmer segment, 2023**

Farmer Segment	Produce less than home consumption (%)	Produce majority for consumption, but sell some (%)	Sell more than they consume (%)
Purchasing farmers			
Non-hybrid	56.5	23.9	19.6
Low-segment	42.9	20	37.1
Mid-segment	25	25	50
High-segment	6.7	26.7	66.6
Farmers who received seed	73.4	13.6	13
Farmers who replanted	100	0	0



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### **Results from our first nutrition Randomized Controlled Trial (RCT) showed statistically significant improvements in zinc status for women and children in rural Guatemala**

In our previous report, we shared that the initial results of Semilla Nueva's first nutrition RCT with Cornell University and the Institute of Nutrition of Central America and Panama (INCAP) were positive. Data analysis in early 2024 showed that the results are statistically significant. Consumption of biofortified maize for four months led to a significant improvement in zinc status, measured by the novel biomarker, LA:DGLA ratio. Cornell has presented the results in a conference and is currently working on a manuscript for a journal publication.

### **Semilla Nueva's bioavailability RCT could solidify the evidence base for the nutritional impact of zinc and iron biofortified maize in Mesoamerica**

A group of leading nutrition experts, including Dr. Erick Boy, board member of Semilla Nueva and head of nutrition for Harvest Plus, has agreed that a Bioavailability Randomized Controlled Trial (RCT) is the primary study needed to consolidate the evidence base for the nutritional impact of our intervention in Central America. Bioavailability studies represent the gold standard in nutrition work for micronutrients since they measure the exact amount of a nutrient absorbed by a given population. While a study on zinc biofortified maize had been completed in Zambia, which showed that biofortified maize consumption led to similar absorption as flour fortification, a study in Guatemala with local maize milling and processing techniques and local maize preparation (tortillas) will solidify this evidence for our local context. Additionally, the study will include an analysis of iron absorption, which has never been done before for biofortified maize. The study is funded by USAID-DIV and is led by Dr. Nancy Krebs at UC Denver, one of the two leading institutes for bioavailability studies in low and middle-income countries.

The primary goal of this randomized, double-blind study is to quantify the total absorbed zinc (TAZ) from one day's consumption and the total absorbed iron (TAI) from two days' consumption by schoolchildren from tortillas made with biofortified maize, compared to those made with conventional maize. The study hypothesizes that tortillas made from biofortified maize will result in significantly higher absorption of zinc and iron. It will involve 56 schoolchildren aged 10 to 14 years of both sexes from the rural community of San José Chirijuyú in the Guatemalan highlands, in the municipality of Tecpán, Chimaltenango. The researchers chose this location due to the higher vulnerability of rural areas to micronutrient deficiencies, more unvaried diets, and higher maize consumption compared to urban areas.

Each week, 5 to 6 households will receive the assigned study maize (either biofortified or control, in a blinded manner). The families will use the study maize to prepare their tortillas and other maize-based dishes. In the first week, only two children—a 10-year-old girl and a 13-year-old boy—will be selected. This initial selection is to adjust the food quantities served during each meal, considering gender and age. Subsequently, each following week, cohorts of 5-6 children will be selected to participate. On zinc isotope administration days (Study Day 4), 5 to 6 children will come to the research center early in the morning to consume all meals for the day and receive oral and intravenous zinc isotopes. Similarly, on iron isotope administration days (Study Days 5-6), participants will arrive at the research center in a fasted state to consume three major meals, with the oral isotope dose administered in sips between bites as the children finish their meals. On the third day after isotope administration (Study Day 7), the research team will visit participants in their homes, or participants will go to the research center to collect morning and afternoon spot urine samples for four days. On Study Day 20, the child and their



parents will return to the center for a 2 ml blood draw to collect erythrocytes for iron analysis. Prior to the blood draw, the child's weight will be measured for use in iron absorption calculations.

The field study is expected to take approximately 14 weeks, starting with the screening of the first cohort on July 31st and concluding with the final cohort on November 20, 2024. Laboratory analyses will be conducted over the subsequent months. Initial internal results should be available by early 2025, with a publication draft expected by May 2026.

**Initial fieldwork has been completed for Semilla Nueva's subsidy design RCT pilot; results are being evaluated and will lead to a more focused and statistically powerful study for 2025**

In 2023, Semilla Nueva began a series of studies to evaluate the most cost-effective subsidy design to increase the adoption of biofortified maize seeds in Guatemala. In 2024, this expanded into two pilots, with the plan to create a more statistically powerful study in 2025 based on initial results. This research measures 1) how different subsidy models and subsidy amounts affect initial adoption and repurchase rates of biofortified seeds among low-income, smallholder farmers and 2) the impacts of the different models and our seeds on the livelihoods, food security, and climate resilience of participating farmers. The collected data will allow us to produce cost-benefit ratios for each subsidy type. Fieldwork is led by Semilla Nueva, with RTC design, oversight, and publication of results conducted by the Paris School of Economics and University of Chicago's Development Innovation Lab (DIL).

The 2024 pilot study focused on delivering vouchers directly to farmers using two different approaches. The first approach focused on commercial subsidies. We identified communities where farmers typically grow conventional maize near agrodealers that sell *Fortaleza* biofortified seeds. Eligible communities were split into three experimental arms, 1) a control group, 2) a group that received an information session about *Fortaleza*, and 3) a group that received an information session and voucher coupons. We provided nearly 300 vouchers with discounts for *Fortaleza* seeds that varied between 25-75% of additional discount beyond our already subsidized price. We also piloted an additional subsidy paid to agrodealer owners and staff to incentivize promotion to farmers. We are still processing data for the supply-side subsidy and up-take from the group that only received an information session. DIL and PSE have processed some early results for voucher redemption. We saw that 26% of farmers redeemed their vouchers—which could be seen as high participation, considering that most farmers had never heard of *Fortaleza* before the intervention. Conversely, compared to studies in other countries, the voucher redemption rate was low.

The second approach focused on voucher delivery to farmers who received a seed donation. In 2023, with support from the Light a Single Candle Foundation, Semilla Nueva donated seed to 3,000 farmers throughout Guatemala. In 2024, we attempted to re-visit approximately 1,500 - 2,000 of these farmers to provide a voucher with a random discount of 25-75%. We are still processing these vouchers, but to date have calculated that 13% of farmers redeemed a voucher.

In both the commercial and donation groups, farmers were more likely to redeem a voucher with the highest discount. In both groups, approximately 35% of vouchers redeemed had the highest value, and the lowest-value vouchers accounted for about 15% of redemptions. This is not surprising, as we expect demand to fall as prices rise, but variation in the performance of different discount levels will provide information necessary for cost-benefit calculations.



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As we continue to review results and plan the scaled-up RCT, it will be critical to choose methods that increase farmer adoption while balancing them with their economic and logistical feasibility in Guatemala. For example, a voucher covering 90% of total retail cost, combined with administrative costs, will be significantly more expensive than the government simply purchasing seed wholesale and delivering them to farmers. We will have more data and analysis to share in our next report.



## FUNDING, ADMINISTRATION, PEOPLE

### Summary

- Semilla Nueva received \$2,078,862 in new grants, renewals, and individual donations, and \$1,263,707 in additional funding commitments from January-June 2024.
- Seven larger funders renewed their support for a total of US\$2,564,979. Four funders increased their support from US\$275,000 in 2023 to a total of US\$570,000 in 2024.
- We expanded our 2024 budget from US\$4.9M to US\$5.4M (a 10% increase) to meet the demands of Semilla Nueva’s growth towards scale.
- Cash-on-hand and committed funding cover 99% of our 2024 adjusted budget; likely renewals and the likely USAID Prime award would extend our cash flow runway to eight months.
- We successfully implemented US-GAAP standards for nonprofits.
- Our External Audit report was issued with no major findings.
- We hired ten employees in the last six months, including a Chief Strategy and Impact Officer, a Research and Learning Director, and a Gene Editing Lead. Our headcount stands at 55.
- We continue to recruit for a COO, Finance and Human Resources Manager, and Production Coordinator.

### \$2.08 million in new grants, renewals, and multi-year funding agreements through June 30

From January through June, Semilla Nueva received \$2,078,862 in new grants, renewals, and multi-year funding disbursements from Cartier, the F.M. Kirby Prize, Mulago, Pulte, The International Foundation, Vitol, USDA-CRIA, and individual donors. Four donors (Cartier, Dave Smith, John Trone, and Ron and Amy Van Auker) increased their support from US\$282,100 in 2023 to a total of US\$570,000 in 2024.

### Semilla Nueva expanded its 2024 budget by 10% to US\$5.4M

We began the year with an approved budget of US\$4.9M, which we increased by 10% to support Semilla Nueva’s rapid growth and prepare for meeting new opportunities for collaboration with the Guatemalan and Salvadoran governments. This increase corresponds to investments in new staff positions (52%), basic and commercial seed production (37%), subsidized seed sales in El Salvador (9%), and staff training (2%).

As of June 30, our budget execution reached 94% (US\$2.8M), as shown in Figure 7. Table 9 shows our historical financial data and forecast for the next four years.

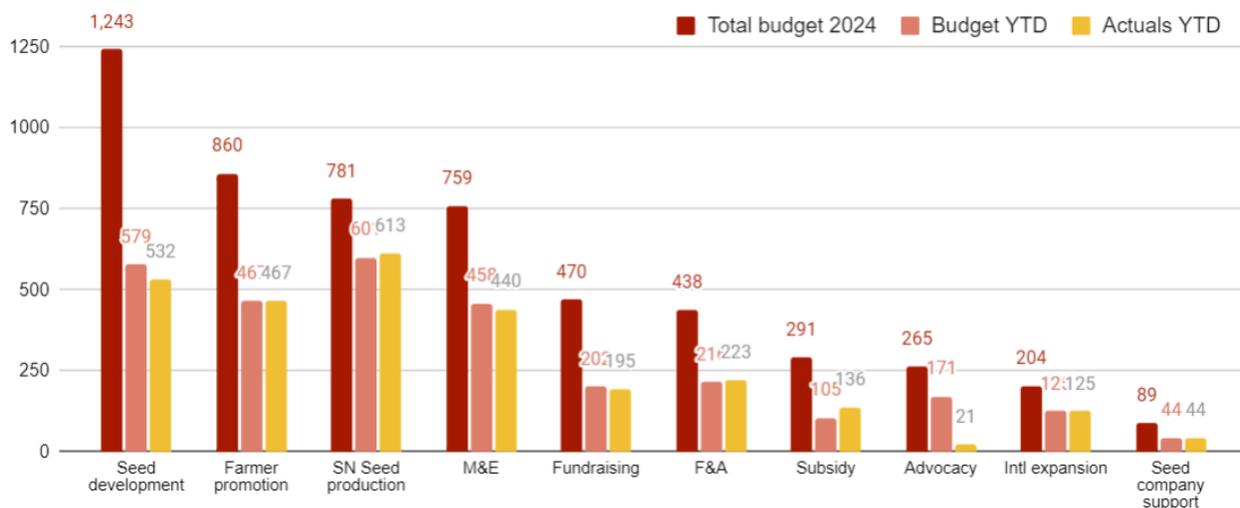


Figure 10: Semilla Nueva 2024 budget vs. actuals as of June (US\$1,000s)



**Table 9: Semilla Nueva Financial history and projections (US\$ 1,000s)**

<b>Financial history and projections</b>							
<b>Costs (\$)</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>
SN seed production	393	490	781	894	760	532	372
Seed company support			89	99	111	125	140
International expansion			204	228	255	286	320
Promotion, training, and sales	397	575	860	963	1,078	1,208	1,353
Subsidy to other seed companies	70	82	291	564	1,051	1,419	1,987
Advocacy and partnerships	194	151	265	422	443	465	488
Seed development	573	756	1,243	1,323	1,323	1,323	1,323
Impact evaluation/M&E	65	129	759	866	927	991	1,061
Admin and HR	310	438	438	468	501	536	574
Development	191	323	470	607	649	695	743
<b>TOTAL EXPENSES</b>	<b>2,193</b>	<b>2,944</b>	<b>5,398</b>	<b>6,434</b>	<b>7,099</b>	<b>7,580</b>	<b>8,361</b>
<b>FUNDING SOURCES</b>							
Bilaterals and multilaterals	0	0	1,571	1,795	1,030	0	0
Foundations	1,772	4,470	3,300	4,100	4,700	5,300	5,800
Individual donors	155	180	400	600	1,200	2,000	2,500
<b>OTHER INCOME SOURCES</b>							
Net sales income	102	138	151	168	168	72	12
Exchange rate gain	109	-14	0	0	0	0	0
Bank interest/other	1	47	84	125	200	250	275
<b>TOTAL INCOME</b>	<b>2,139</b>	<b>4,822</b>	<b>5,506</b>	<b>6,788</b>	<b>7,298</b>	<b>7,622</b>	<b>8,587</b>
<b>Surplus or deficit</b>	<b>-54</b>	<b>1,878</b>	<b>108</b>	<b>354</b>	<b>199</b>	<b>42</b>	<b>226</b>

**Cash and commitments for 2024 cover five months of operating expenses**

As shown in Table 10, cash availability has increased from US\$1.1M in January to US\$5.3M at the end of 2024 through received and confirmed funding.

Furthermore, risk-adjusted projections for likely renewals and the high probability of a USAID Prime award represent an additional 2.8 months of cash. Semilla Nueva’s Board designated reserve balance of US\$1M could provide 3.5 months of operating expenses if needed.



**Table 10: Projected cash-flow and funding gap 2024 (US\$ 1,000s)**

Financial projections 2024 (US\$ 1,000s)		
Cash beginning balance Jan 1 2024	\$1,142	22%
Confirmed or received funding	\$4,143	78%
<b>Cash on hand/confirmed funding 7/31/24</b>	<b>\$5,285</b>	100%
Expenses projections 2024	\$5,327	
<b>Funding gap</b>	<b>-\$42</b>	-1%
Cash availability in months	5	months
<b>Other leverage sources</b>		
Risk adjusted likely renewals and USAID Prime	\$854	2.8 months
Board designated reserves balance	\$1,037	3.5 months
Cash availability in months		11.3 months

**Our 2023 financial audit is in full compliance with US-GAAP for nonprofits and produced no significant findings**

During 2023, the finance team adjusted Semilla Nueva's accounting to comply with international standards (US-GAAP for nonprofit organizations). These adjustments included separating restricted and unrestricted income, classifying program, fundraising, and administration expenses, and consolidating US and Guatemala operations. The 2023 audit report and Form 990 are available [here](#).

**10 new hires in the first half of 2024, with three vacancies to be filled in the coming months**

We have hired and onboarded ten new staff members to fill new positions: three in Research and Development, two in Communications and Fundraising, two in Operations, one in Monitoring & Evaluation, one in Finance, and one lead for our anticipated USAID Prime project.

Semilla Nueva is currently recruiting for three key positions: a COO to oversee operational and management functions, a Finance and Human Resources Manager to handle day-to-day financial management, administrative systems, and HR, and a Production Coordinator to manage our growing seed company partnerships and boost overall seed production.

**Key hires and partnerships: strategy, impact, gene editing, and policy/USAID leadership**

Rasa Dawson recently joined our team as Chief Strategy and Impact Officer. Rasa brings extensive experience in communications, advocacy, campaign management and fundraising for NGOs. With a 14-year tenure at Oxfam and a 5-year leadership role at StrongMinds, she brings a passion for scaling impactful organizations, strategic planning, and working in partnerships to achieve maximum impact.



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She will help guide the sustainable and scalable growth at Semilla Nueva in fundraising, brand, research and program impact.

Through an agreement with the University of Chicago's Development Innovation Lab (DIL), Jess Rudder, a postdoctoral scholar at DIL, will join our team as Research and Learning Director. Jess has previously collaborated with Semilla Nueva to develop and publish third-party impact evaluations and has supported our monitoring, evaluation, and program design efforts. In this new role, Jess will strengthen our monitoring and evaluation capacity as we expand our work and will continue to involve DIL researchers in these efforts.

Kasey Markel, a plant synthetic biologist with 10 years of experience in molecular biology research, joins Semilla Nueva as our Gene Editing Lead. In his new role, Kasey will develop our gene editing strategy and lead collaborations with scientific institutions assisting with the research and implementation of these new technologies.

Claudia Valenzuela will join Semilla Nueva as Chief of Party to lead our USAID Prime award. Claudia is an international development specialist with over 18 years of experience in government and USAID programs in Central America. Most recently, she served as Deputy Chief of Party for a major USAID-funded program in Guatemala. Her extensive experience in public policy and negotiating with governments on behalf of nonprofit development projects will be invaluable as we co-design and implement a national seed subsidy with the Guatemalan government.