

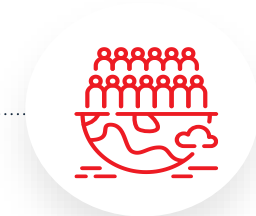


Protecting your Harvest from infestation

An Innovating Food Security Solution
by Adpack



The world is facing a global food crisis, and by the year 2050 food production will need to increase by 50% to sustain the growing global population...



Population Growth: A growing world population (currently at 7.6B and expecting to reach 10B) is increasing the demand for food



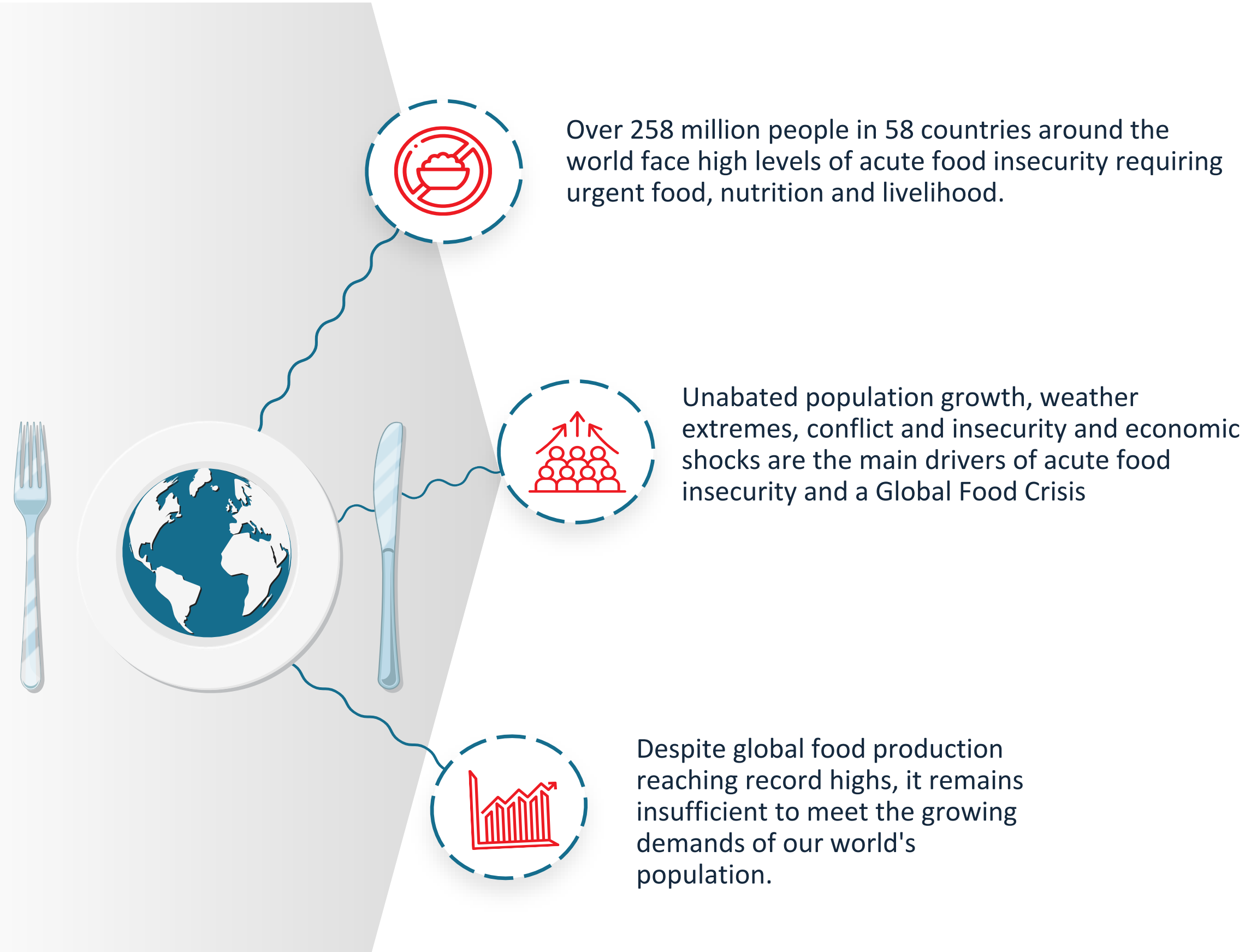
Extreme Weather: Climate change has meant that weather patterns have become more erratic, droughts have become longer, and torrential rain is causing more flooding all leading to **recurring failed harvests and food shortages.**



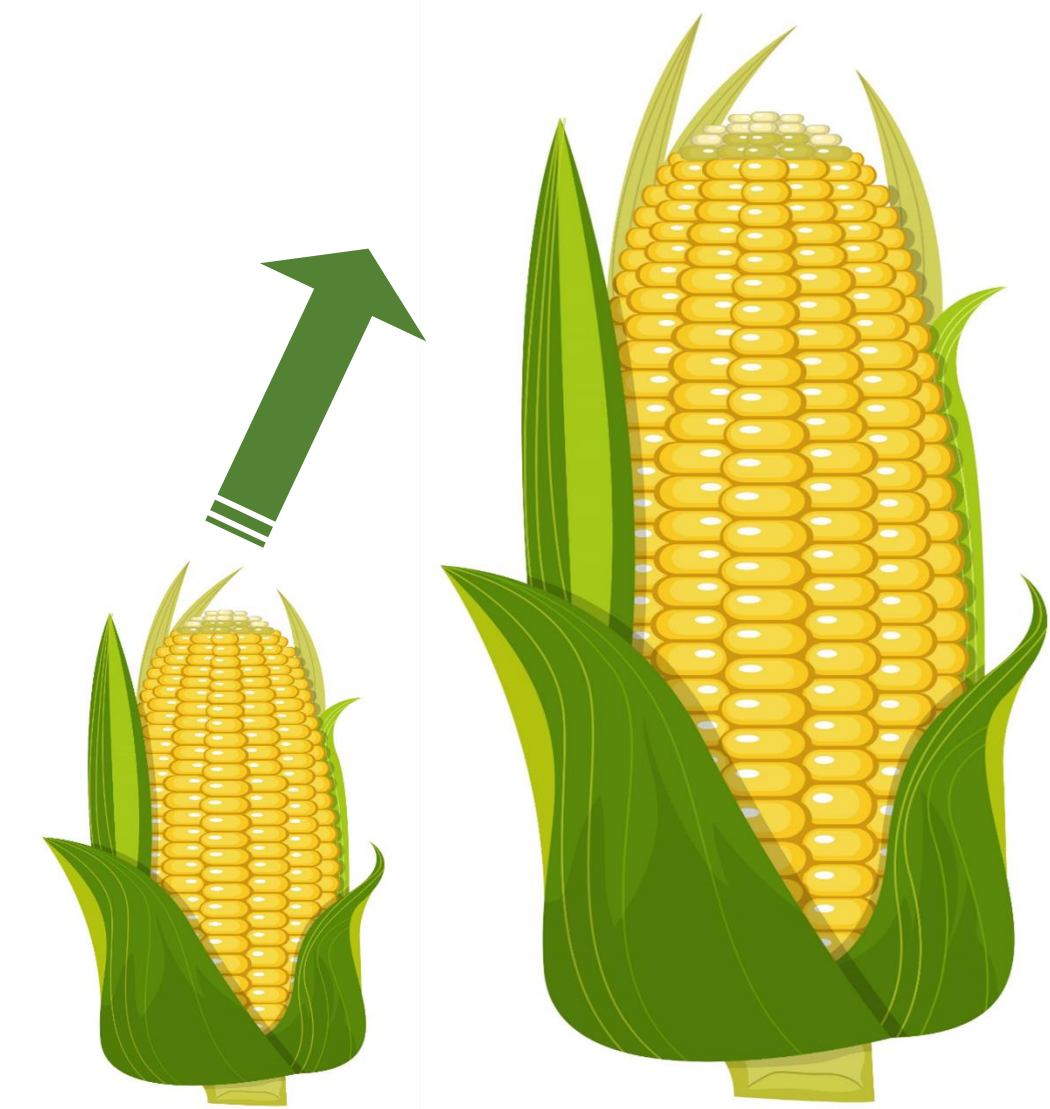
Conflict and Insecurity: There are more conflicts around the world meaning existing farming is being disrupted further **increasing the pressure** on an already scarce resource



Economic Shocks: Soaring grain prices; severe deterioration in household purchasing power and land fragmentation (resulting in smaller farm sizes and soil degradation) which has continued unabated in most African countries are all driving **more people to the brink of starvation**



By 2050, with the global population expected to reach 10 billion, the world will require nearly **50% more food to meet the increasing demand.**



2.8Bn Mt

4.2Bn Mt

Crop infestation is an ancient problem; one that continues to plague mankind leading to significant post-harvest losses

Despite Mankind's efforts over millennia to control insect infestation (ancient Sumerians around 2500 BC applied Sulphur powder to their food), many current pest control practices remain:

- Outdated and ineffective (e.g., charcoal dust or ash)
- Prohibitively expensive for smallholder farmers (e.g., metal silos)
- Difficult for smallholder farmers to implement without the right tools or knowledge (e.g., fumigants)
- Raising concerns about toxicity (e.g., chemical crop dusts)

Additionally, many countries still face high insect infestation rates in crops due to large policy gaps and outdated Integrated Pest Management (IPM) regulations.



Post Harvest losses around the world exceed 1Bn tons per annum; in Kenya it can reach as high as 40% of all crops harvested



1.3Bn of food tons is lost

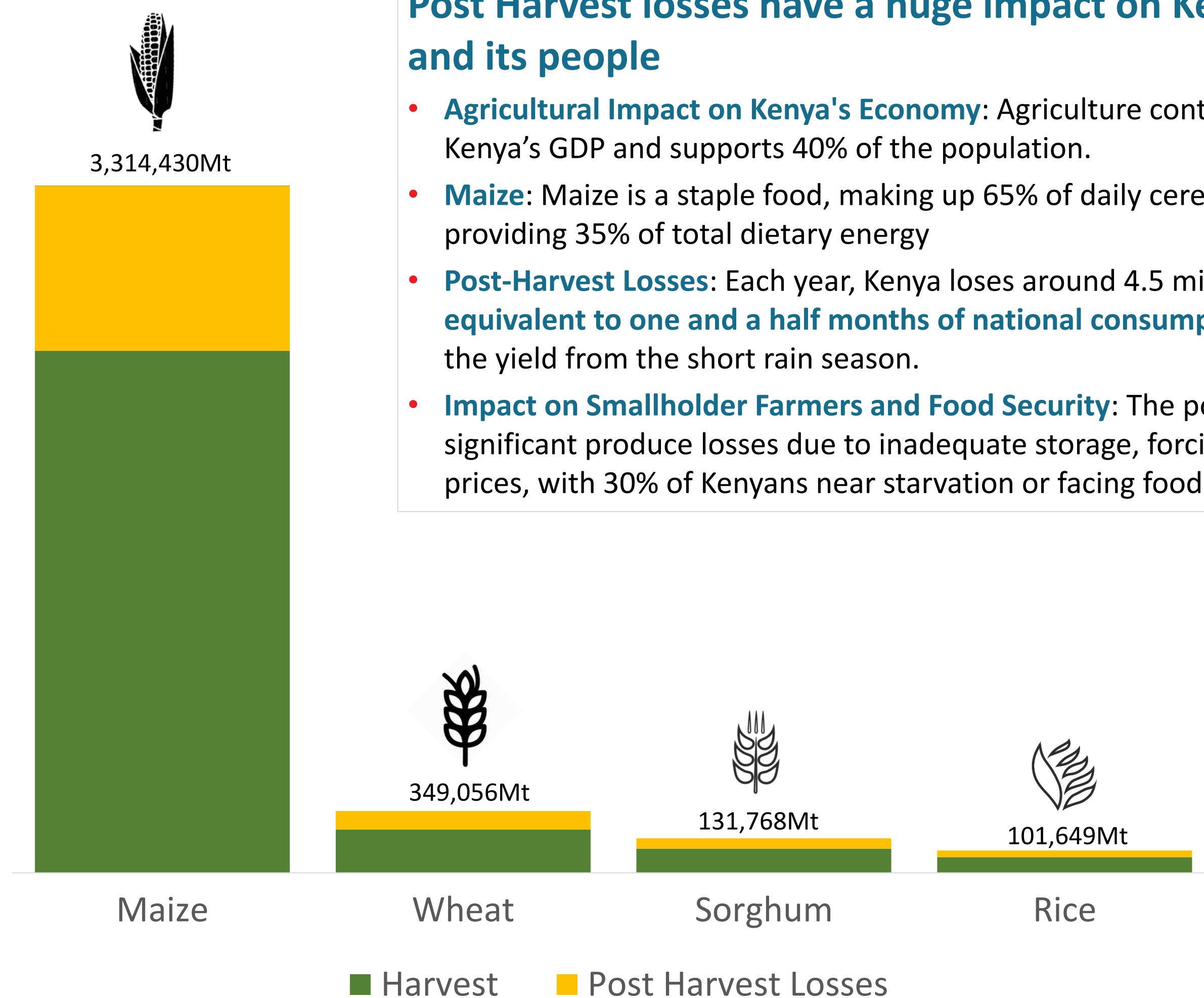
Annually, around the world one-third of all food intended for human consumption is lost or wasted, amounting to approximately 1.3 billion tons in Post-Harvest Loss.

258M+
people in 58 countries face high levels of acute food insecurity

20%
Of people in Africa are facing hunger or starvation every day

1/3
of all food intended for human consumption is lost or wasted

\$4billion
Africa loses a staggering amount of grain every year due to post harvest losses



Post Harvest losses have a huge impact on Kenya's economy and its people

- **Agricultural Impact on Kenya's Economy:** Agriculture contributes over 50% to Kenya's GDP and supports 40% of the population.
- **Maize:** Maize is a staple food, making up 65% of daily cereal consumption and providing 35% of total dietary energy
- **Post-Harvest Losses:** Each year, Kenya loses around 4.5 million bags of maize, equivalent to one and a half months of national consumption and exceeding the yield from the short rain season.
- **Impact on Smallholder Farmers and Food Security:** The poorest farmers face significant produce losses due to inadequate storage, forcing them to sell at low prices, with 30% of Kenyans near starvation or facing food poverty.

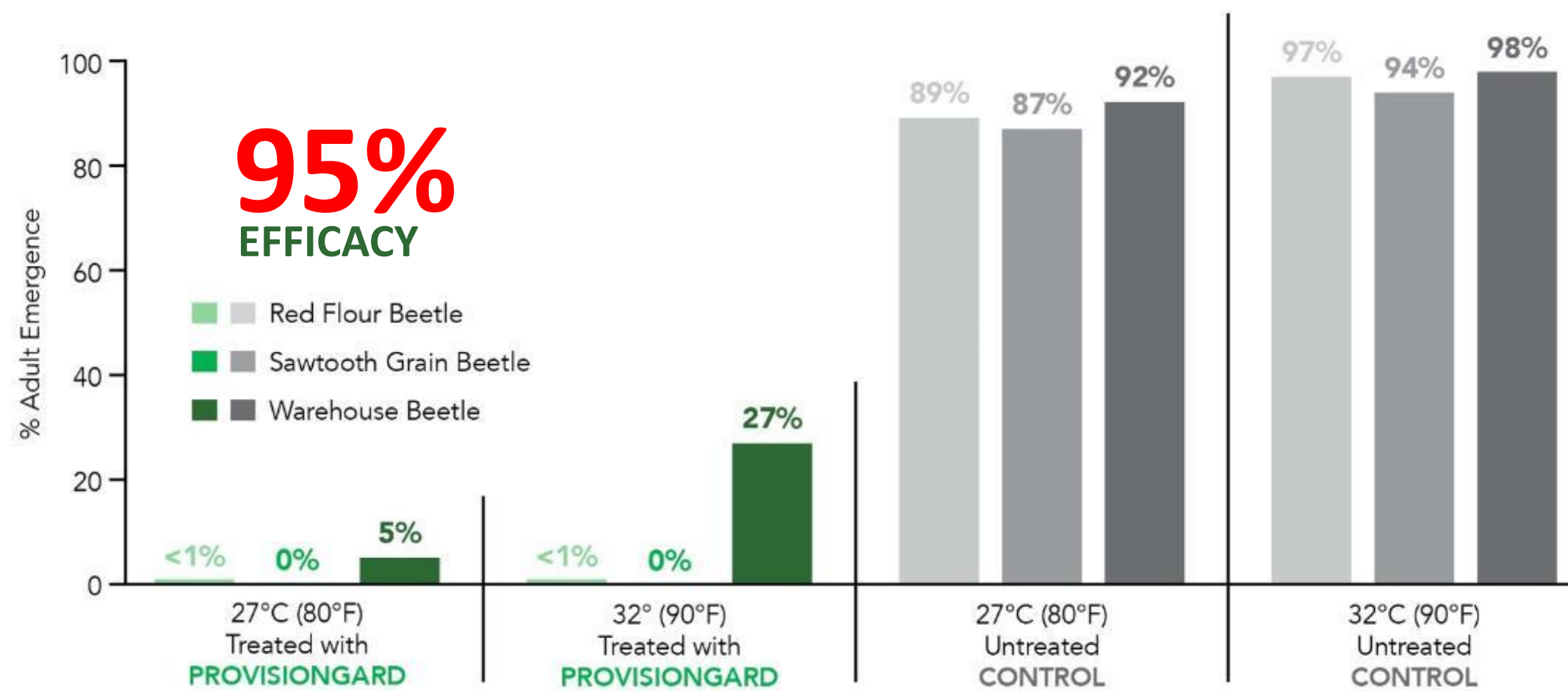
GrainGard® an innovative proven solution to fight post harvest losses caused by insect infestations in stored grains and cereals



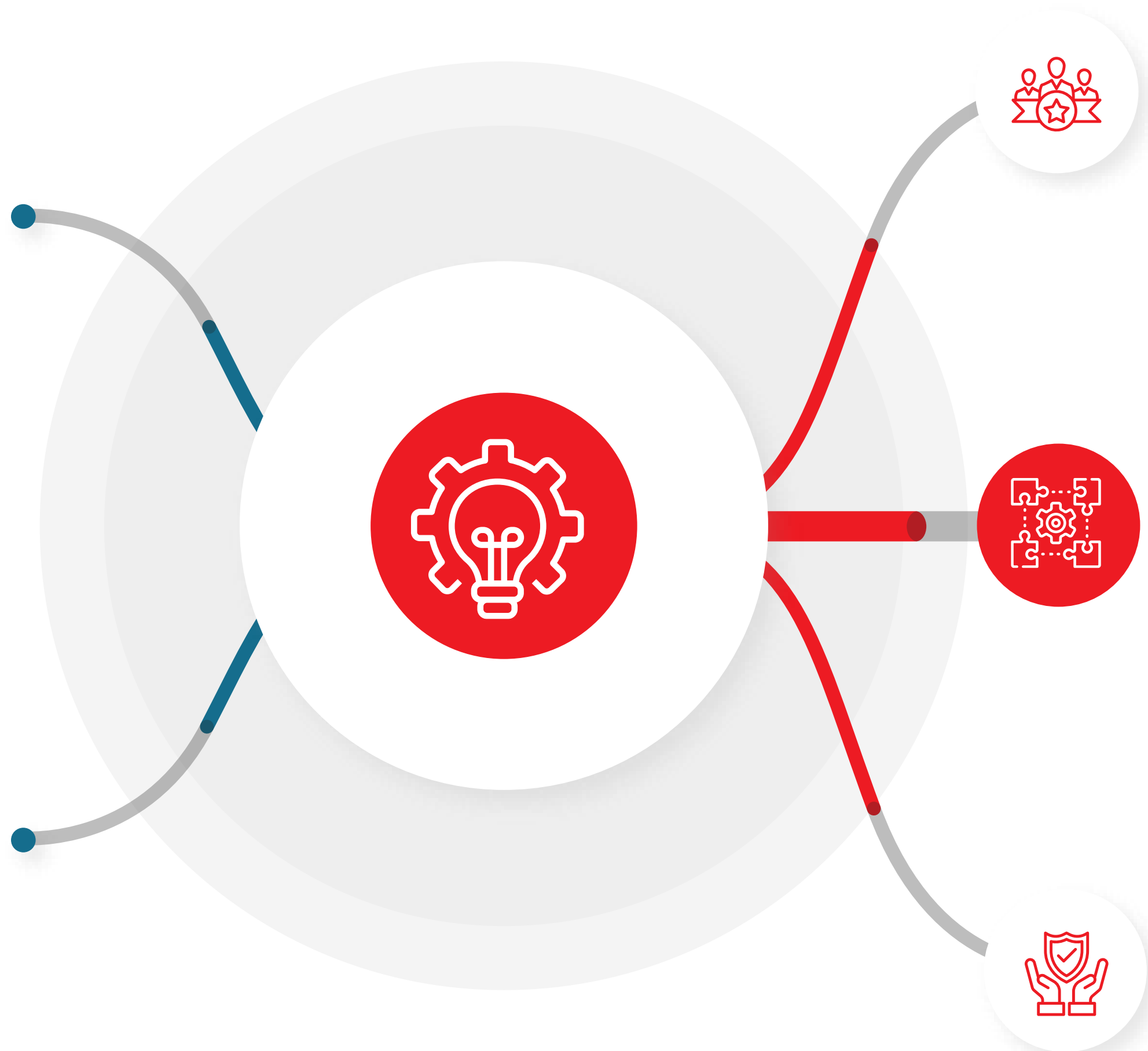
- GrainGard®
 - Is innovative woven sack that is already in use around the world; GrainGard® safeguards grains and cereals from most stored-product insects such as large grain borers by the use of a special **non-toxic** additive impregnated into the fibers of the bag – the additive is safe for humans but stops insects by disrupting their growth cycle.
 - All GrainGard® bags are fully **recyclable, non-toxic, and non-hazardous**, meeting stringent standards set by the **EPA**, and **FDA**. The **European Framework Regulation (EC NO 1935/2004)** as well as **Indian food safety standards 2011**

CASE STUDY: Brazil Packaging Study

Conducted by the US Dept. of Agriculture, 8-2022



GrainGard® is manufactured in Kenya by Adpack Limited



Adpack, a leading woven sack manufacturer in Africa, produces 100,000 bags per day. We also work closely with Persons with Disabilities



Adpack's campus is based in Athi River and provides employment to over 250 people including several persons with disabilities

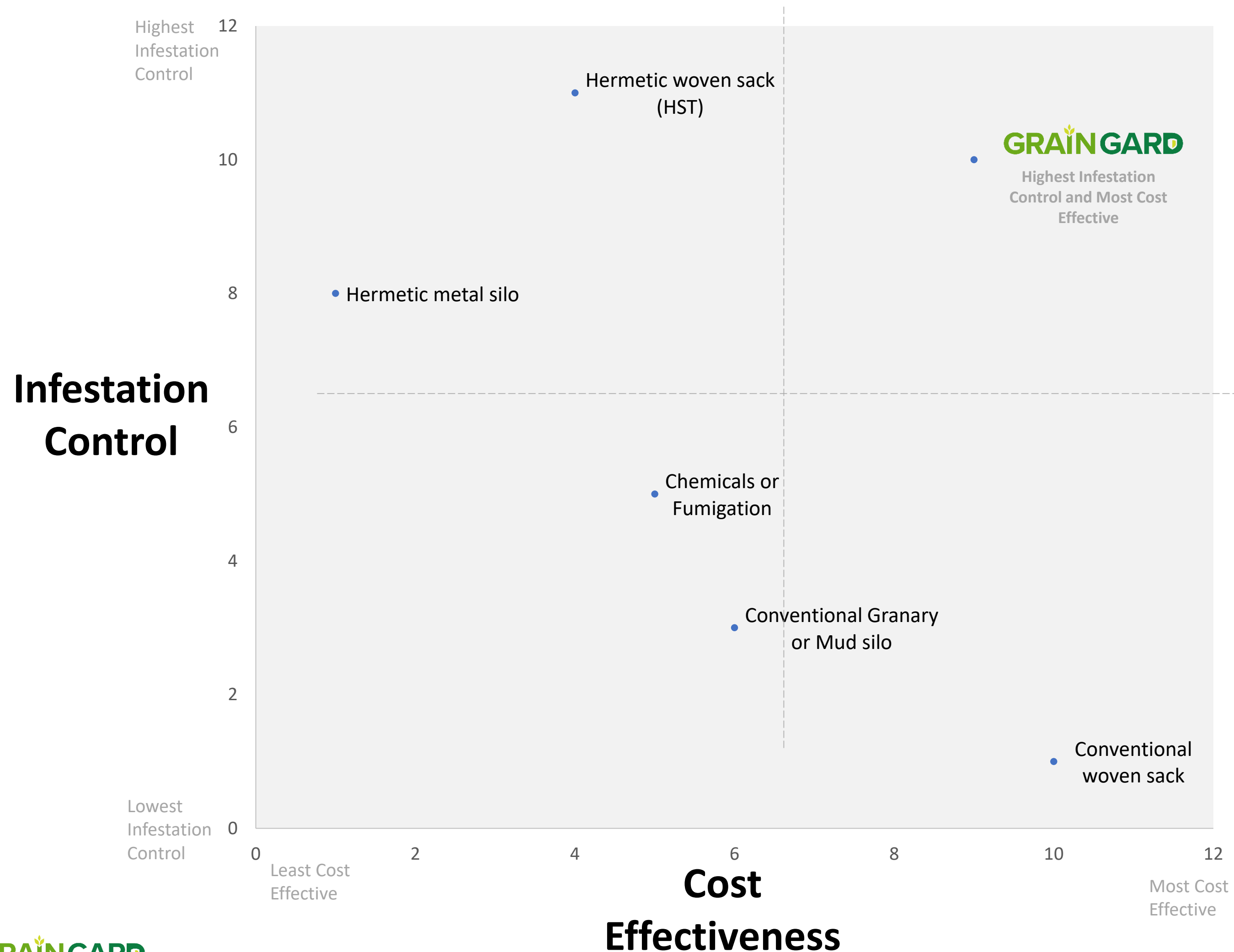


Insect infestation is a major cause of post-harvest losses...farmers use many storage systems to reduce infestation



Storage System	Advantages	Disadvantages	Cost	Grain Quality and Losses after Storage
Conventional woven PP Sack	Simple to use Available in different storage capacities Occupy less space	Do not last long Easy access to pests and rodents Susceptible to water	US\$ 0.65 per 90 kg poly bag US\$ 1.6 for jute bags	Low cost, Low quality, High loss
Conventional granary or mud silo	Simple to make and use Available in different storage capacities	Occupy large space all time Do not last long Pests, insects, and rodents can get into the structure easily	About US\$ 10 for approx. 500kg storage capacity	Medium cost, Low quality, High loss
Chemicals or Fumigation	Can be effective if applied at correct doses Crop Dusting is easy to use Fumigation is very costly	Potential health hazards Significant downtime for fumigation High cost for fumigation	Actellic super cost US\$ 3.3 per 90 kg bag Fumigation chemicals – USD 1.5 per KG fumigants but add in the downtime and it can be upwards of USD 8 per KG Need to apply every 3 months	High cost, Low quality, Low loss Growing resistance to insecticides
Hermetic metal silo	Simple to design and construct Easy to use Durable	Metal sheets are expensive High skills required for construction	US\$ 29 for 90 kg capacity US\$ 243 for 1.8 ton capacity	Very High cost, High quality, Low loss
Hermetic woven sack (HST)	Low cost of production Simple, flexible, and durable Easy to use	Can be destroyed by sharp objects, pest, and rodents	US\$ 3 for PICS bag US\$ 5.3 for 90 kg Super Grain Bag	High Cost, High quality, Low loss
GRAIN GARD	Simple to use and Non-Toxic (complies to Global Regulations – EPA/FDA and EU) Prevents pest and insect infestation Reusable and recyclable Cost-effective	Significantly cheaper than hermetics, fumigation and silos	US\$ 1.00 per 90 kg sack	High quality, Low loss

GrainGard® addresses a critical and costly problem in an inexpensive manner, delivering highly effective results...



GrainGard® has multiple benefits resulting in its widespread adoption

- 1. User-Friendly:** No training, No special chemicals, or change in user behavior required.
- 2. Cost-Effective:** Cheaper than silos, hermetics, fumigation, and other alternatives.
- 3. Variety of Sizes:** Available in sizes ranging from 5kg to 90kg.
- 4. Widely Accepted:** Included in WFP and USAID specifications; adopted by National Cereals boards in several countries already.
- 5. Non-Toxic:** No need for additional chemicals or frequent fumigation, ensuring safe food.
- 6. Long-Term Protection:** Provides indefinite protection for grains and cereals.
- 7. Easy Manufacturing:** Additives are simple to integrate into any factory in Africa, requiring no specialized knowledge or machinery



GrainGard® addresses a critical and costly problem in an inexpensive manner, delivering highly effective results...

Just like a mosquito bed-net, GrainGard bags contain a non-toxic insect growth inhibitor that decreases post-harvest losses by 95%.

Our goal in the next 12 months is to reduce post-harvest losses for 5500 smallholder farmers who lose up to 30% of their yearly harvest in post harvest losses – a large majority is due to insect damage.

- The average cost of one 90kg bag of maize has been around KES 4000/-
- A smallholder farmer typically has about 3 acres of land
- Each farmer yields about 25 bags per acre for a total of 75 bags per farm
- A smallholder farmer faces losses of about KES 90,000 per farm

- ✓ 550,000 GrainGard bags
- ✓ 5500 farmers
- ✓ Avg KES 90,000 extra per farmer

Impact – 5500 Farmers
KES 500M





Irene

Adpack Employee

I've been working at Adpack for 1 and half years now.



THANK YOU!

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7 Reasons Why Farmers Are Adopting GrainGard®

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