Breeding time reduced to eight years from 12-15 years thanks to:

- **Rapid generation advance (RGA)** using greenhouse with controlled light and temperature enabled three generations per year

**First high-oleic groundnut cultivars commercialized in India**

**Oleic acid content**
The new high-oleic groundnut cultivars Girnar 4 & Girnar 5 contain about 80% oleic acid as compared to regular varieties 45-50%. Oleic to linoleic acid ratio is 17:1. Grain quality are good with flavor comparable to US confectionery peanuts.

**Pod yield**
Dry pod yield (kg/ha) recorded was 3,118 for Girnar 4, and 3,124 for Girnar 5 with an average advantage ranging from 37-57% compared to GPBD 4, and TG 37A.

**Crop cultivation**
These new varieties were released in 2019, and are recommended for cultivation in kharif season in Tamil Nadu, AP, Karnataka, and Gujarat. Maturity is 110-113 days.

**Parental background**
The breeding populations were developed at ICRISAT by crossing popular local varieties with a high oleate Virginia type variety developed in the USA (SunOleic 95R).

**FAST & COST-EFFECTIVE BREEDING PROCESS**
- Single nucleotide polymorphism (SNP) markers enabled screening thousands of F2 populations to detect the high-oleic FAD mutants
- Quick and non-destructive near infrared reflectance spectroscopy (NIRS) evaluates oleic acid content and other seed components e.g. protein and oil in early generations making selection more streamlined. Intact seeds could still be used to maintain genotypes.
- Rapid generation advance (RGA) using greenhouse with controlled light and temperature enabled three generations per year

**PARTNERSHIPS DELIVER INNOVATIONS**
- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
- Directorate of Groundnut Research, Indian Council of Agricultural Research (ICAR)
- Junagadh Agricultural University, India
- Acharya N G Ranga Agricultural University, India
- Professor Jayashankar Telangana State Agricultural University, India
- National partners enabling extensive field testing.

**INNOVATION LAUNCH & COMMERCIALIZATION**
- On World Food Day 2020, Indian PM Narendra Modi launched Girnar 4, and Girnar 5 as among 17 biofortified crop varieties dedicated to India.
- With over 35 participating entities indicating high industry acceptance of these new groundnuts, it is projected to reach consumers with high-oleic groundnuts in two to three years.

**BROADER RELEVANCE**
This innovation contributes to SDG 2 “End hunger, achieve food security and improved nutrition and promote sustainable agriculture”, and SDG 3 “To ensure healthy lives and promote well-being for all at all ages”.

These cultivars contribute to nutrition and food security goals, which have been taken up by users, and are at Maturity level 3 i.e. policy and/or practice changes influenced by these new high-oleic groundnuts have led to adoption or impacts at scale or beyond the direct CGIAR sphere of influence. Among others, this is evidenced by the sharing of high oleic groundnut breeding lines developed at ICRISAT in Patancheru with collaborators in nine countries in Asia and Africa, including Australia.

http://gldc.cgiar.org