

First Fully Annotated Pigeonpea T2T Genome

Prelims: Current events of national and international importance | Agriculture

Why in News?

Recently, the Indian Council of Agricultural Research (ICAR) developed India's first fully annotated telomere-to-telomere (T2T) reference genome of pigeonpea (*Cajanus cajan*) variety 'Asha'.

- **Pigeonpea (Arhar/Tur)** - One of India's most important pulse crops and a major source of dietary protein.
- **Earlier Work** - ICAR-NIPB published of a pulse crop, pigeonpea variety 'Asha', which was also the first crop genome to be sequenced entirely in India in 2011 and improved version in 2017.
- **Latest Achievement** - Complete T2T genome sequence, providing chromosome-level completeness.

Genome Details

- **Assembly** - 752.65 million base pairs, 92 contigs.
- **Coverage** - All 11 chromosomes, 11 centromeres, 22 telomeres.
- **Annotation** - 36,557 genes, 48,008 mRNAs.
- **Accuracy** - >99.9% transcriptome read alignment.

Significance

- **National Resource** - Serves as reference for gene discovery, pangenome analyses, molecular breeding, genome editing.
- It has been approved as the **global reference genome, marking a major milestone in pulse research.**
- **Agronomic Traits** - Enables development of climate-resilient, high-yielding, pest-resistant, and nutritionally enriched varieties.

ICAR's Role

- Develops **improved pulse varieties.**
- Supervises **breeder seed production.**
- Conducts **multi-location trials.**
- Demonstrates **technologies via institutes and Krishi Vigyan Kendras (KVKs).**
- Provides **scientific support** for capacity building and dissemination.

Reference

[PIB | Pigeonpea](#)

