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MAGAZINE NOTES

Speed Breeding — Fast-Tracking Climate-Resilient Agriculture

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SCIENCE & TECH

ENVIRONMENT

GS3

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Speed Breeding — Fast-Tracking Climate-Resilient Agriculture

 **Down to Earth** Chapter 11 · 1 min read ·

The Problem

- Conventional crop breeding takes **10-14 years** — by the time a climate-resilient variety is released, climatic baselines have already shifted

The Technological Solution

- **Speed Breeding:** Controlled-environment technique manipulating light (**22 hours LED, 2 hours dark**), temperature (**22-28°C day, ≤17°C night**), and CO₂ to accelerate plant growth
- Achieves **4-5 generations per year** (vs 1-2 conventionally)
- Uses “controlled stress” (dense planting, low nitrogen) to force early flowering
- Drastically cuts breeding cycle to **~6 years**

Impact & Achievements

- **SKUAST Srinagar:** Traditional 130-140 day rice cycle slashed to just **~60 days**
- **ICRISAT:** Developed pigeon pea variety **ICPV 25444** — tolerates 45°C heat, matures in 125 days
- Critical for securing **SDG 2 (Zero Hunger)**

UPSC Angle

- **GS3:** Agriculture, food security, S&T applications

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SPEED BREEDING:

Light regime: 22 hrs LED / 2 hrs dark

Temperature: 22-28°C (day), ≤17°C (night)

Generations per year: 4-5 (vs 1-2 conventional)

SKUAST rice cycle: 130-140 days → ~60 days

ICRISAT pigeon pea ICPV 25444: tolerates 45°C, 125-day maturity



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