

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION

RAJYA SABHA
UNSTARRED QUESTION NO-3206
ANSWERED ON- 20/03/2026

**RESEARCH AND DEVELOPMENT INITIATIVES FOR CLIMATE-RESILIENT MANGO
VARIETIES**

3206. DR. AJEET MADHAVRAO GOPCHADE:

Will the Minister of AGRICULTURE AND FARMERS WELFARE be pleased to state:

- (a) whether Government is aware that unseasonal and early rainfall during the peak mango season in recent years has adversely impacted mango productivity and quality, if so, the assessment made in this regard;
- (b) whether Government, in coordination with the Indian Council of Agricultural Research (ICAR) and State Agricultural Universities, has undertaken research and development initiatives to evolve climate-resilient and off-season mango varieties; and
- (c) whether any dedicated research centres, field trials or pilot projects have been established to develop and promote off-season mango cultivation practices, if so, the details thereof?

ANSWER

THE MINISTER OF STATE FOR AGRICULTURE AND FARMERS WELFARE
(SHRI BHAGIRATH CHOUDHARY)

(a): The unseasonal and early rainfall have caused substantial yield reduction of mango across various mango growing regions of the country. Dry weather is a prerequisite for proper flowering and fruit development in mango. Rains during flowering disrupt the pollinators' activity leads to poor fruit set in mango. High humidity and wet condition also aggravate the diseases like anthracnose, powdery mildew and blossom blights that cause considerable reduction in yield. Pest infestation is also aggravated due to early rainfall.

Pilot studies indicated the extent of damage varied across regions depending on the severity, timing and duration of rainfall as well as the variety affected and impact of unseasonal and early rainfall. The remedial measures to control the effect of unseasonal and early rainfall on mango production include the following:

- Timely application of recommended fungicides and insecticides
- Use of growth regulators for improving flowering and fruit retention
- Adoption of fruit bagging and installation of fruit fly traps
- Proper pruning and canopy management for improved aeration
- Improvement of orchard drainage to prevent waterlogging
- Promotion of eco-friendly and botanical plant protection measures

(b): Several ICAR institutes and State Agricultural Universities (SAUs) are working on climate resilient varieties and technologies in mango. Some of the climate resilient varieties of mango are Arka Udaya and Arka Suprabhath developed by ICAR-Indian Institute of Horticultural Research, Bengaluru, CISH Arunika and Awadh Abhaya from ICAR-Central Institute for Subtropical Horticulture, Lucknow and Pusa Arunima and Pusa Shreshtha by ICAR-Indian Agricultural Research Institute, New Delhi. Climate resilient technology such as CISH Mango Good Agricultural Practices (GAP) along with biological control measure using Trichoderma helps in escaping the impact of climate change. Canopy management and use of plant growth regulators have been recommended for off-season flowering in mango. Phenological studies indicated that Neelum, Kalepad and Totapuri have produced flowering and fruiting in off-season under South Indian conditions. Further research is under way to develop climate resilient varieties and technologies along with salinity tolerant rootstock.

(c): In the recent past, efforts have been made to identify, collect and conserve the multi-season flowering and fruiting varieties in Andhra Pradesh (Royal Special / Punasa), Tamil Nadu (Kurukkan & Neelum), Goa and Gujarat (Bajarang) to get good market price during the off-season (September – February). Multi-season flowering in local accessions have also been reported from Andaman & Nicobar Islands.

A research project on ‘Understanding the mechanism of off-season flowering and fruiting in mango under different environmental conditions’, conducted with the support of National Agricultural Innovation Project (NAIP), ICAR, New Delhi, also identified 10 promising off- season clones, 6 commercial varieties and 4 farmers varieties in Kanyakumari for off-season production.
