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

**LOK SABHA**
**UNSTARRED QUESTION NO. 1552**
TO BE ANSWERED ON 9TH DECEMBER, 2025

**DEVELOPMENT OF CLIMATE RESILIENT MANGO VARIETIES**

1552. SHRI PARSHOTTAMBHAI RUPALA:

Will the Minister of AGRICULTURE AND FARMERS WELFARE कृषि और किसान कल्याण मंत्री be pleased to state:

(a) whether the Government is aware that in recent years, early rainfall during the peak mango season have severely affected mango overall yield and if so, the details thereof;

(b) the details of the steps taken by the Government in coordination with the Indian Council of Agricultural Research (ICAR) and State Agricultural Universities, to promote research and development of off-season and climate-resilient mango varieties; and

(c) whether any dedicated research centres or pilot projects have been established for developing off-season mango cultivation techniques and if so, the details thereof?

**ANSWER**

THE MINISTER OF STATE FOR AGRICULTURE AND FARMERS WELFARE
कृषि और किसान कल्याण राज्य मंत्री (SHRI BHAGIRATH CHOUDHARY)

(a): The unseasonal rains have caused substantial yield reduction of mango across various 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 rains and the flowering is also delayed in many locations. 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 which is given in **Annexure**.

(b): Different institutes of ICAR and State Agricultural Universities (SAUs) are working on climate resilient mango varieties. Arka Udaya has been developed by ICAR-Indian Institute of Horticultural Research, Bengaluru as climate resilient, which comes to fruiting in July-August in Bengaluru conditions. The fruits are medium in size (200-250 g) with bunch bearing habit and better keeping quality (12-15 days). ICAR-Central Institute for Subtropical Horticulture, Lucknow has developed and released climate resilient varieties CISH Arunika and Awadh Abhaya. Awadh Abhaya is temperature tolerant and anthracnose tolerant. Both CISH Arunika and Awadh Abhaya escape heavy rainfall and matures in August. The late-maturing mango hybrids Pusa Arunima and Pusa Shreshtha developed by ICAR-Indian Agricultural Research Institute, New Delhi tolerate anthracnose and unseasonal rain and climate change-associated adversities.

(c): In the recent past efforts have been made to identify, collect and conserve the multi-season flowering and fruiting varieties in Andhra Pradesh (var. Royal Special / Punasa), Tamil Nadu (var. Kurukkan & Neelum), Goa and Gujarat (var. Bajarang) to get good market price during the off season (September – February). Several multi-season flowering 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. Neelum, Kalepad and Totapuri have produced flowering and fruiting in off-season at Kanyakumari. Sporadic and Sparse off-season flowering was identified in Totapuri, Punasa, Niranjan and Royal Special in Karanataka. West Coast of Konkan was identified for off-season flowering and success in advancing 2.5 month mango season was possible with paclobutrazol application (15 May – 15 June) in Konkan region.

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**Annexure**

**[Part (a) of Lok Sabha USQ No. 1552 dated 9TH DECEMBER, 2025]**

**State–Year–Impact–Remedy format**

| Sl. No. | State (AICRP Centre) | Year(s) of Occurrence | Impact on Mango Crop | Remedial / Mitigation Measures |
|---|---|---|---|---|
| 1 | **Bihar (Sabour)** | 2020 (Feb–Mar) | 10–13% yield reduction in cv. Langra; increased blossom blight during flowering | Spray Carbendazim + Mancozeb @ 2 g/l before flowering (two sprays at 10-day interval) |
| 2 | **Gujarat (Paria)** | 2020–21 to 2024–25 | Poor flowering, low fruit set, premature fruit drop; increased pest & disease incidence due to off-season rainfall and cyclonic rains | Timely fungicide/pesticide sprays; advisories issued; fallen mature fruits utilised for processing |
| 3 | **Jharkhand (Ranchi)** | 2025 | 12–16% yield loss due to fruit fly infestation, sooty mould and fruit blackening (cv. Amrapali) | Fruit bagging, fruit fly traps, proper pruning and package of practices |
| 4 | **Maharashtra (Vengurle & Rahuri)** | 2023–2025 | Low flowering and yield loss due to rains in January & May; early and erratic rainfall | Fungicide sprays (Hexaconazole, Sulphur); timely advisory to farmers |
| 5 | **Manipur (Imphal)** | Annual (Jun–Jul) | Sooty mould and non-attractive fruit skin appearance. However yield mostly unaffected | Spray neem oil @ 2 ml/l and fermented rice water (organic practice) |
| 6 | **Tamil Nadu (Periyakulam)** | 2023–2025 | Severe flower drop and pest/disease incidence; yield loss: 32–35% (2023), 75–80% (2024), 46–55% (2025) | Spray Urea/$KNO_3$ for flowering; NAA/$KNO_3$ for fruit retention; Paclobutrazol; fungicide and insecticide sprays; field advisory programmes |

| Sl. No. | State (AICRP Centre) | Year(s) of Occurrence | Impact on Mango Crop | Remedial / Mitigation Measures |
|---|---|---|---|---|
| 7 | **Telangana (Sangareddy)** | Last 5 years | 40–50% loss due to prolonged rainfall and waterlogging | Improve drainage; prune damaged branches; spray $KNO_3$/Urea; pest & disease monitoring; fungicide sprays |
| 8 | **Tripura (Lembucherra)** | 2021–2025 | 10–20% annual loss from pre-monsoon showers, storms and hail | Plant dwarf variety (Amrapali); create drainage channels; windbreaks and bunds |
| 9 | **Uttar Pradesh (Lucknow)** | 2023–2025 | 3–6% yield loss due to shoulder browning & anthracnose; panicle damage by storms | Fruit bagging (10–25% area); spray difenoconazole @ 0.05% |
| 10 | **Uttarakhand (Pantnagar)** | 2021–2025 | 10–50% reduction in severely affected orchards due to pest/disease pressure, flower & fruit damage | Improve ventilation (pruning); remove infected debris; maintain drainage; eco-friendly sprays; regular monitoring |

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