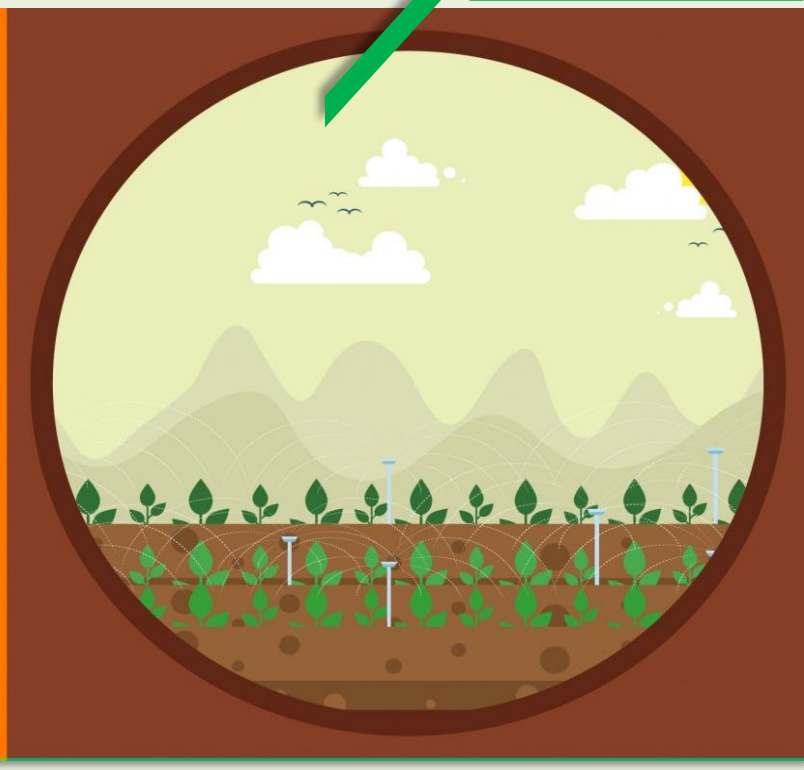
Stress Management Agro-Advisory for the State of Maharashtra

May 16-29, 2025



Compiled & Edited by :
RN Singh, Scientist (Agricultural Meteorology)

Advisory Committee:
KK Pal, NP Kurade, S Kochewad, V Salunkhe, Neeraj Kumar, Rajkumar, Aliza Pradhan, PS Khapte, Vijay Kakade, Pravin Taware & Sunil Potekar

Technical Support :
Pravin More, Tech. Officer (Computer)

ICAR-National Institute of Abiotic Stress Management
Baramati, Pune, Maharashtra

Managing Abiotic and Biotic Stresses in Agriculture

Agro-Advisory for the State of Maharashtra

(May 16-29, 2025)

Advisory No.: NIASM/MH/25-09 **Date: May 16, 2025**

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1. Weather Forecast (India Meteorological Department, New Delhi)

1.1. Rainfall

- Rainfall is likely to range between 1–5 mm/day, remaining above normal across most parts of the state.

1.2. Temperature

- The maximum temperature is expected to range between 32-36ºC, remaining 2-5ºC below normal in most parts of the state.
- The minimum temperature is expected to range between 22-26 ºC, remaining 1-2ºC below normal in most parts of the state.

2. Managing Abiotic Stresses

2.1. Atmospheric Stresses

2.1.1. Crops

- **Grape:** Remove the protective covers used to minimize the high temperature stress when 3-5 leaf stage is achieved. Retain 8-10 shoots per square meter area and remove side shoots below sub-cane to facilitate better light penetration for bud fruitfulness.
- **New Plantations:** In case of newly planted orchards, support the plants by tying them straight using bamboo sticks to avoid injury on main stem due to sun-burn, thunderstorms, and heavy winds. All the spraying activities should be done in the morning or in the evening hours.

2.1.2. Livestock

- Avoid overcrowding of animals in livestock shed
- To protect the animals from hailstorms, the animals should not be left tied up or restrained outside during a storm.
- Repair the roofs of shed and ensure that animal sheds are leak-proof and well-ventilated.
- Establish proper drainage systems to prevent waterlogging and moisture buildup.
- Control of ecto-parasites and endo-parasites should be carried out
- The floor of the animal shed should be kept clean and dry
- Maintain the surrounding of animal shed clean and hygienic and remove the unwanted vegetation nearby the sheds.

2.2. Water Stresses

2.2.1. Crops

- **All orchards:** In the areas where daytime temperature is still high, use agro-wastes as soil cover (organic mulch) to minimize moisture loss through evaporation.
- **Grape:** After foundation pruning, during the shoot growth stage, apply 30,000 – 37,500 L per ha per day of irrigation water. If the vigour is more than desired, then reduce irrigation water application by 50% or stop irrigation till such time growth is controlled.
- **Sweet orange:** Provide regular irrigation @ 100-120 L per day per plant to the fruit bearing trees.
- **Mango:** Maintain good soil moisture status through drip irrigation by providing 30-35 L water per day per plant to avoid fruit drop as well as better growth of fruit in case of High Density Plantation.

- **Vegetable crops:** Use of mulching and drip irrigation system for new transplantation in vegetable crops for efficient use of water and to avoid weed growth.
- Light irrigation is to be applied in vegetable crops as and when required.
- **Brinjal:** Use of grafted eggplant seedlings for transplanting. Foliar application of salicylic acid (0.3-0.5g/L) at monthly interval after transplanting will help to overcome the effect of water stress.

2.2.2. Livestock

- Silage can be prepared if excess green fodder is available for future use during scarcity periods.
- Mixed silage of sugarcane tops up to 50% level may be prepared with jowar or maize fodder in case excess green fodder is available. The silage thus prepared may be useful for feeding livestock during the upcoming summer/ scarcity period.
- Store sufficient dry fodder to meet the needs during the rainy season, as green fodder has high moisture content during this time.
- Store feed and fodder in dry, well-ventilated areas to prevent mould growth and spoilage.

2.2.3. Fisheries

Preparation of the pond for stocking of the fish

1. Construction of new pond, strengthening of embankment and side slopes may be completed during this period with optimum depth of 2.0-3.0 m with 1.5 m height to maintain water throughout the year at maximum possible capacity
2. Apply cow dung @ 0.75-1.0 ton/ha after application of lime at the corner of the pond
3. Measure turbidity of the pond water with the Secchi disc for maintenance of pond water transparency (30-45 cm)
4. Application of powdered lime at pond bottom @ 120-130 kg/ha and after 10 days of lime application water may be filled in the fish pond
5. Monitor the water quality parameters viz. dissolved oxygen (6.0-7.0 ppm), pH (7.0-8.5), ammonia (0.05 ppm), nitrate (50-150 ppm), nitrite (0.1 ppm), CO_2 (less than 10 ppm), and H_2S (0.002 ppm) in fish pond carefully.

Recommendation for stocked fish

6. Fish farmers are advised to use high protein diets (30-35 %) during this month.
7. Fish farmers must use farm made pellet feeds to reduce feed wastage and achieve better feed conversion efficiency.
8. To avoid the fungal, bacterial and parasitic diseases, fish farmers may use potassium permanganate @ 1-2 kg/acre or limestone @ 50-75 kg/acre. Salt application @ 100 kg/acre also helps in protecting fish against disease outbreak during winters
9. Time to time the growth of the fish may be checked for better maintenance of fish stock and diseases protection
10. The unutilized feed in the feeding tray may be checked frequently to avoid ammonia toxicity
11. The farmers are advised to aerate their ponds either by adding fresh water or by using aerators to maintain oxygen level in fish pond

2.3. Soil Stresses

- **Sweet Orange:** Apply 3.5 kg N, 5.0 Kg P_2O_5 and 5.0 kg K_2O i.e. Urea 7.5 kg, Phosphoric acid 6 kg and MOP 8.30 kg/ ha at weekly interval through fertigation.
- **Pomegranate:** Immediately after harvest of hasta bahar fruits and pruning, apply 20-25 kg Farm Yard Manure + 2 kg Neem-cake per plant along with 205 g N, 50 g P_2O_5, 152 g K_2O, and 80 g Mg (800 g $MgSO_4$) per plant depending on the age of the plant followed by light irrigation during rest period.
- **Orchards:** Cover the tree basins or the bunds with green mulch or agro-wastes for regulation of soil temperature, moisture retention and to avoid salinity build up at root zone area.

- **Pomegranate:** After harvesting of *Haste bahar* crop, undertake pruning operation to remove the bearing branches, and apply 20 kg FYM along with Neem-cake @2 kg per plant.

3. Managing Biotic Stresses

3.1. Crops

- **Grape:** If cloudy weather persists, spray Mancozeb 2.5 g/L and wettable Sulphur 2 g/L, to avoid primary infection of fungal diseases. Second spray of copper oxychloride @ 2.5 g/L to be given after 10 days' interval. Spray Thiamethoxam 25 WG @ 0.3 g/L for managing hopper infestation.
- **Citrus:** For management of thrips during active vegetative growth, spray Spinosad 45 SC @ 0.25 ml/L or Spinetoram 11.7 SC @ 0.3 ml/L water when thrips population is 5 per shoot or above. Use yellow and blue sticky traps in orchard @ 20 per ha. If trees are showing oozing symptoms of gum then scrap the area with a sharp knife and apply Mefenoxam MZ-68 or Fosetyl Al paste on it. Apply Bordeaux paste on the tree trunk up to height of 60 cm by paint brush.
- **Acid lime:** If citrus trees are showing oozing symptoms of gum then scrap the area with a sharp knife and apply Mefenoxam MZ-68 or Fosetyl Al paste on it. Apply Bordeaux paste on the tree trunk up to height of 60 cm by paint brush.
- **Mango:** Spray Dimethoate 30EC @ 1.5 ml/L followed by Deltamethrin 2.8EC @ 1ml/L when fruits are marbel sized to manage stone weevil and fruit borer infestation. If floral malformation is seen, remove and destroy affected portion along with sufficient shoot and follow it up with spray of Carbendezim 50WP @ 1.5 g/L.
- **Pomegranate:** To manage thrips, install yellow/ blue sticky traps @ 75 per hectare randomly at 15 cm below from the canopy top of the plant. To control fruit borer infestation, remove all the damaged fruits with holes and dispose them by burying in pit and take a spray with any one of the insecticide Cyantraniliprole 10.26% OD @ 0.75 ml/L or Chlorantraniliprole 18.5% SC @ 0.75 ml/L or Flonicamid 50% WG @ 0.75-1.0 ml/L water.
- **Brinjal:** To manage mango fruit and shoot borer, use water trap/Leuci lure pheromone traps @ 12/ ha to monitor, attract and kill male moths and change the vial once in three weeks. Also spray Chlorantraniliprole 18.5 SC @ 0. 3 ml/L once in 15 days depending upon the population of the pest.
- **Solanaceous and Cucurbitaceous vegetables:** Fluctuation in daily mean temperature may increase the infestation of mites and to manage them, spray Spiromesifen 22.9 SC @ 0.5 ml/L or Abamectin @ 0.5 ml/L.
- **Dragon fruit:** Pruning of diseased cladodes followed by fungicide spray Mancozeb + Carbendazim @2.5g/L or Bordeaux mixture @10g/L after harvesting fruits.
- **All vegetable crops:**
    - To avoid incidence of disease and pest in solanaceous vegetable crops, maintan optimum /recommended plant spacing.
    - Procure healthy and disease-free seedlings from certified nursery only.
    - Spray liquid formulation of *Trichoderma* sp. @ 5ml/litre as a preventive measure for effective management of diseases
    - To manage soil-borne pathogens, apply *Trichoderma* sp. + *Pseudomonas* sp. @ 1litre/acre through drip irrigation system.
    - Follow integrated pest and diseases management practices such as disease-free seedlings from certified nursery, drenching with copper oxychloride @ 2.5 g/L of water to avoid post-transplanting damping-off in addition to use of systemic insecticides like Imidacloprid @ 0.5 ml/L to manage sucking pests.

3.2. Livestock

- There is a very high risk (VHR) of Haemorrhagic Septicaemia (HS) in the Ahmadnagar, Akola, Amravati, and Nashik districts. There is a very high risk of Black Quarter (BQ), and of Enterotoxaemia (ET) in Ahmadnagar district.

- Affected animals may be isolated and treated with suitable antibiotics and vaccination is to be done in consultation with the local veterinarians.
- There is a very high risk of Peste des Petits Ruminants (PPR), Classical Swine Fever (CSW) and Sheep and Goat Pox in the Ahmadnagar, and Pune districts.
- There is a very high risk of Foot and Mouth Disease (FMD) in Ahmadnagar, Mumbai, Mumbai suburban and Nandurbar districts.
- There is a very high risk of African Swine Fever in the Amravati, and Nashik districts
- There is a very high risk of Lumpy Skin Disease (LSD) in Amravati, Mumbai, Mumbai suburban and Nandurbar districts.
- Vaccination for FMD, PPR, LSD and Sheep and Goat Pox in the concerned districts may be done in consultation with the local veterinarians.
- There is a very high risk of Babesiosis in the Mumbai, Mumbai suburban and Nandurbar districts.
- There is a very high risk of Fasciolosis in the Ahmadnagar district. There is a very high risk of Theileriosis in Amravati, Mumbai, Mumbai suburban Nandurbar and Nashik districts. There is a very high risk of Trypanosomiasis in Amravati, and Nashik districts.
- Ensure 100% vaccination with timely boosters for PPR, HS and S &G pox alongside routine testing in VHR districts to enable early disease detection. Additionally, adopt effective snail control measures, and biosecurity practices.
- Monitor animals for any sickness particularly related to digestive, dermal, or respiratory problems, and treat them by consulting a veterinarian.
- Regular deworming should be carried out by consulting local Veterinarians.
- For treatment of ectoparasitic infestation, dipping (if not done during the last three months) needs to be carried out with Ectomin/Butox, post-shearing on sunny days. Anti-parasitic drugs should be used under the guidance of a veterinarian.
- Spot the sick animals and isolate them in a separate shed for treatment.

4. General

- **Citrus:** Looking into deficiency symptoms at the time of growth in new flush, spray solution containing Sulphates of Zinc (0.5%), Manganese (0.05%), Iron (0.25%), Magnesium (0.5%), Boron (0.1%) and Molybdenum (0.003%). In addition to that, apply 25 g each of Sulphate of Zinc, Manganese and Iron per tree.
- **Foliar spray solution:** Use good quality water for spraying of agrochemicals preferably neutral or slightly acidic. If water is alkaline (pH~8), use Citric acid @ 0.5 g/L, to increase spray efficacy. Use sticker and spreader adjuvants during rainy days.

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