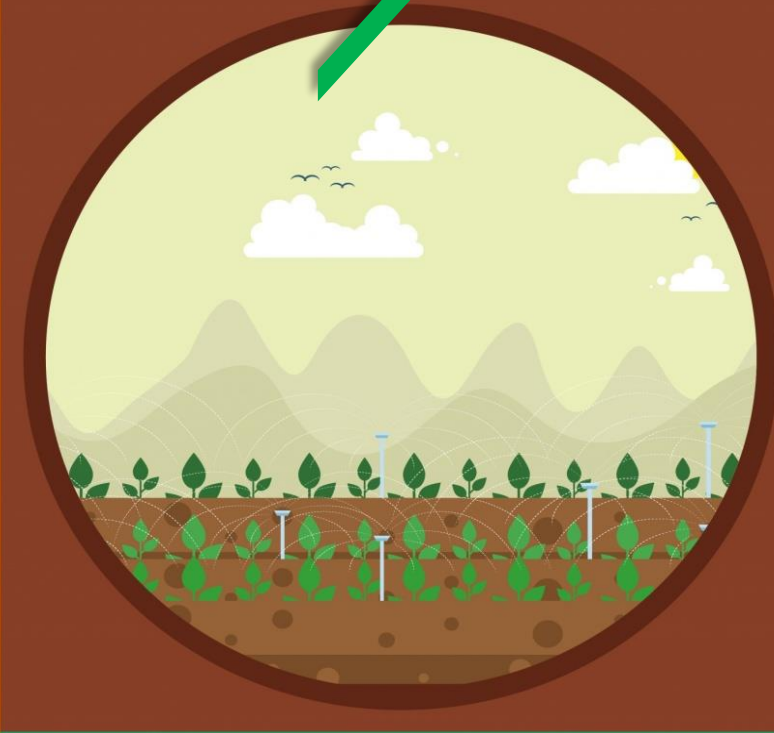




Stress Management Agro-Advisory for the State of Maharashtra

March 15-28, 2024



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Managing Abiotic and Biotic Stresses in Agriculture

Agro-Advisory for the State of Maharashtra

(March 15-28, 2024)

Advisory No.: NIASM/MH/24-05

Date: March 15, 2024

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

1.1. Rainfall

- The forecast indicates that most parts of the state should not expect any rainfall over the next two weeks.

1.2. Temperature

- In first week, the maximum temperature may vary between 34-36°C remaining up to 1°C below normal in most parts of the state, while in the second week, it may remain 36-38°C in most parts, except Vidarbha where it may remain between 38-40°C, remaining 1-2°C above normal in most parts of the state
- The minimum temperature may vary between 18-22°C. It may remain 1-2°C below normal in Madhya Maharashtra and Konkan, while 1-2°C above normal in Marathwada and Vidarbha regions.

2. Managing Abiotic Stresses

2.1. Atmospheric Stresses

2.1.1. Crops

- **Grape:** Retain the shade covers on the orchard that were meant for avoiding sunburn, to help protecting bunches from hailstorm.
- **New Plantations:** To avoid sunburn in newly planted saplings, protect them from bright sun with the help of temporary shade.

2.1.2. Livestock

- To protect livestock from heat stress, keep the animals indoor during peak hot hours
- The sidewalls of the animal shed to be covered with curtains/gunny bags to protect the animals from hot winds
- Avoid overcrowding of animals in livestock shed
- If available, the animals should be fed with good quality green fodder
- Control of ecto-parasites and endo-parasites should be carried out
- The floor of the animal shed should be kept clean and dry
- The grazing of animals should be done during the cooler hours of the morning and evening

2.2. Water Stresses

2.2.1. Crops

- **Orchards:** Use plastic or live mulch for conserving soil moisture. Sub-surface irrigation technique will also help in minimizing moisture loss due to evaporation.
- **Sweet orange:** Provide regular irrigation @ 60-70 L per day per plant for *ambe bahar* and 90-100 L per day per plant for ongoing *hasta bahar*.

- **Mango:** Maintain good soil moisture status through drip irrigation by providing 25-30 L water per day per plant to avoid early fruit drop as well as better fruit growth in case of High Density Plantation.
- **Vegetable crops:** Frequent irrigation to be given through drip system while ensuring mulching to reduce direct evaporation of soil moisture and infestation by weeds/pests /diseases. Use of shade net for leafy vegetable cultivation to reduce the impact of high temperature and drought stress.
- **Onion:** Foliar application of Potassium nitrate (100mg/L) after vegetative, bulb initiation and bulb development stage will help to alleviate the effect of water stress.
- **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

- Provide clean and potable drinking water to animals round the clock
- Provide mineral mixture @ 30-40 g/day/cattle for improving milk production and reproductive efficiency

2.2.3. Fisheries

- Harvest the previously stocked fish preferably by 1st week of April
- Remove all small and unwanted fishes from the pond as they compete for food, space and oxygen with the stocked fishes.
- Clear all aquatic weeds from the water as well as pond embankment.
- Complete de-watering of pond is recommended. It shall ensure complete removal of fish and unwanted vegetation.
- After dewatering remove the pond bottom mud and the excavated mud can be used for strengthening the pond dyke.
- Expose the pond bottom to bright sun for about 15-20 days till cracks are developed.
- Alternatively, Mahua oil cake @ 2000-2500 kg/ha or bleaching powder having 30% chlorine content @ 350 kg/ha can be applied to kill the leftover fishes and other aquatic organisms.
- The farmers are advised to check the pH of water before lime application. In case it is above 8.5, they shall not use lime.
- Limestone @ 50-100 kg/acre, potassium permanganate @ 1-2 kg/acre and salt @ 100 kg/acre may be applied in pond to avoid fungal, bacterial and parasitic diseases like fin rot, gill rot, EUS and argulosis.
- Monitor and maintain 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), CO₂ (<10 ppm), and H₂S (0.002 ppm) in the fish pond. For this, aerate the ponds either by adding fresh water or by using aerators to maintain oxygen levels in the fish pond.

2.3. Soil Stresses

- **All orchards:** Cover the tree basins or the bunds with mulch or agro-wastes for regulation of soil temperature, retention of moisture and to avoid salinity build up at root zone area.
- **Grape:** During rest period of 15 to 20 days after harvesting to back pruning, 10% of recommended fertilizers i.e. 26 kg N, 18 kg P₂O₅ and 26 kg K₂O per acre to be applied through fertigation.

- **Sweet Orange:** Apply 3.5 kg N, 5.0 kg P₂O₅ and 5.0 kg K₂O i.e. Urea 7.5 kg, phosphoric acid 6 kg and MOP 8.30 kg per hectare at weekly interval through fertigation.

3. Managing Biotic Stresses

3.1. Crops

- **Mango:** Spray Thiamethoxam 25% WG @ 0.25 g/L for managing hopper infestation. Spray Carbendazim 50WP @ 1.5 g/L for avoiding sooty-mould development on infested leaves and anthracnose on panicles.
- **Mango:** To manage various pests, follow IPM practices like waxy polythene band on tree trunk at 30 cm height to manage mealy bug infestation in future and pheromone traps for fruit fly and light traps for fruit borer.
- **Sweet Orange:** Spray Imidachloprid 17.8 SL @ 0.3 ml L⁻¹ for control of leaf miner and thrips infestation.
- **Brinjal:** Use of water trap/Leuci lure pheromone traps to manage fruit and shoot borer to monitor, attract and kill the male moths @ 12 ha⁻¹ and change the vial once in three weeks and spray Chlorantraniliprole 18.5 SC @ 0.3 ml L⁻¹ once in 15 days depending upon the pest population.
- **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⁻¹ or Abamectin @ 0.5 ml L⁻¹.
- **All vegetable crops:**
 - It is necessary to follow integrated pest and diseases management practices such as disease-free seedlings from certified nursery, drenching with copper oxychloride @ 2.5 g L⁻¹ of water to avoid post-transplanting damping-off in addition to use of systemic insecticides like Imidacloprid @ 0.5 ml L⁻¹ to manage sucking pests.

3.2. Livestock

- There is very high risk of Peste des Petits Ruminants (PPR) in Ahmadnagar, Amravati, Dhule Jalgaon, Nanded, Nandurbar, Nashik and Pune districts. Very high risk of Foot and Mouth Disease (FMD) in Ahmednagar and Nashik districts.
- Vaccination for FMD and PPR (animals above 3 month of age) may be done in consultation with the local veterinarians and as advised by the state animal husbandry authorities.
- There is very high risk of Anthrax in Parbhani and Pune districts. There is very high risk of Haemorrhagic Septicaemia (HS) in Ahmednagar, Hingoli and Nashik districts. Very high risk of Black Quarter (BQ) in Ahmednagar and Latur districts. There is very high risk of Enterotoxaemia in Latur and Satara districts. Affected animals may be isolated and treated with suitable antibiotics and vaccination is to be done in consultation with the local veterinarians.
- There is very high risk of sheep and goat pox in Ahmednagar, Nashik, Pune, Sangli and Satara districts. There is very high risk of Classical Swine fever in Chandrapur, Gadchiroli and Kolhapur districts. Vaccination may be done in consultation with the local veterinarians.
- There is very high risk of Theileriosis in Ahmadnagar, Amravati, Nashik and Sangli districts.
- Monitor animals for any sickness particularly related to digestive, dermal or respiratory problems and treat them by consulting a veterinarian.
- For treatment of ecto-parasitic infestation, dipping (if not done during last three months) need to be carried out with Ectomin/Butox, post-shearing on sunny days. Anti-parasitic drugs should be used under guidance of a veterinarian.
- Spot the sick animals and isolate them in a separate shed for treatment.

4. Other advisories

4.1. Crops

- **Grape:** Harvest grapes at perfect maturity i.e. at TSS 16-18 °Brix depending on variety. Harvest bunches above the knot on rachis and avoid bruising of berry surface during post-harvest handling for better shelf life.
- **Mango:** Spray Calcium nitrate 3g + Boric acid 1 g per L or Calcium-Boron chelated formulation 2.0 g/L to reduce fruit drop.

4.2. Livestock

- If excess green fodder is available, prepare silage (Murghas). Mix silage of sugarcane tops (upto 50%) may also be prepared for use during summer/scarcity period.

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