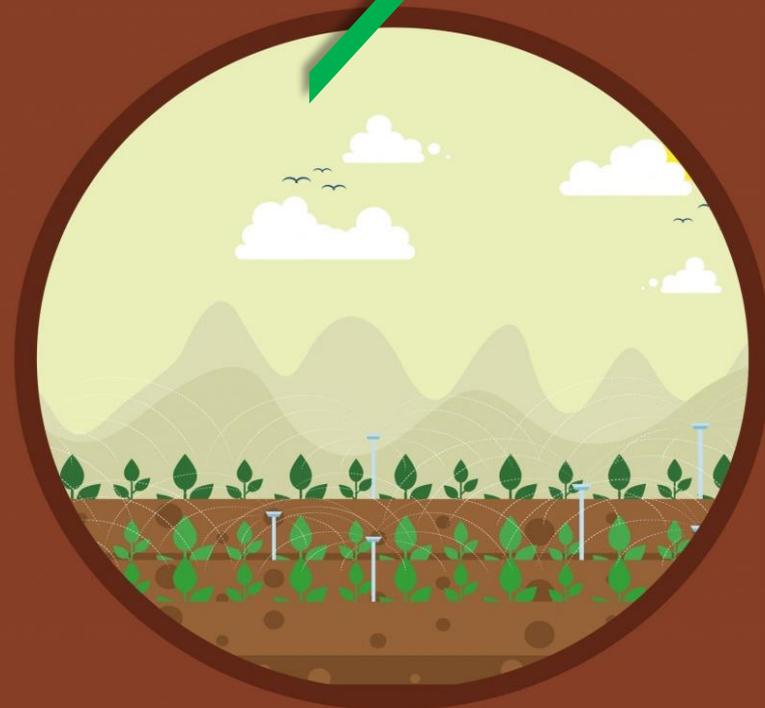




Stress Management Agro-Advisory for the State of Maharashtra

September 16-29, 2022



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Managing Abiotic and Biotic Stresses in Agriculture

Agro-Advisory for the State of Maharashtra

(September 16 - 29, 2022)

Advisory No.: NIASM/MH/22-19

Date: September 15, 2022

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

1.1. Rainfall

- In the next two weeks, the rainfall may remain below normal in most parts of the state.
- In the first week, most parts of the state may receive rainfall 10-20 mm/day; while in the Marathwada region it may vary between 5-10 mm/day.
- In the second week, most parts of the state may receive rainfall 5-10 mm/day.

1.2. Temperature

- The maximum temperature may vary between 28-32 °C. It may remain up to 2 °C below normal in most parts of the state.
- The minimum temperature may vary between 20-24 °C. It may remain up to 2 °C below normal in most parts of the state.

2. Managing Abiotic Stresses

2.1. Atmospheric Stresses

2.1.1. Crops

- **Grape:** Cane maturity may get affected due to continuous cloudy weather and rains. Check the cane maturity by observing cross section at middle of the cane. If the pith is not yet dark brown, delay pruning by 10-12 days.
- **Dragon fruit:** Harvest the fruits at correct maturity i.e., 2-3 days after rind colour changes from green to red, as over-mature fruits tend to crack/soften especially during high humid condition. Remove damaged fruits immediately and follow clean cultivation.
- **Spraying operations:** Do not spray during heavy wind and immediately after rains. Use sticker adjuvant along with spray solutions.

2.1.2. Livestock

- Repair roofs of the animal sheds wherever necessary to ensure protection for animals from rains.
- Protect the livestock from cold winds and rainfall by providing proper shelter.
- The floor of the animal shed should be kept dry and clean.
- The feed and fodder should be stored properly to prevent the growth of moulds.
- Maintain the surrounding of animal shed clean and hygienic and remove the unwanted vegetation nearby the sheds.

2.1.3. Fisheries

- Use Aerator system during rain to maintain the pH and dissolved oxygen.
- Keep space in the pond to accommodate rainwater during monsoon.
- Maintain pond dykes in low-lying areas, where large volume of runoff water from adjoining catchment area can enter the pond.
- To prevent erosion of pond dykes due to heavy rainfall, grow grass and other plants on the slopes as well as on the top crest to prevent erosion and avoid excess turbidity.

2.2. Water Stresses

2.2.1. Crops

- **Kharif crops:** Drainage channels should be formed to prevent waterlogging in the fields.
- **Orchards:** In case rain exceeds 5 mm on a given day, irrigation water application can be skipped for that day. Prepare the drains to move out excess water from orchards and avoid water logging at root zone.
- **Vegetables:** In the rainy season vegetable crops should be transplanted onto the raised beds for proper drainage of excess water.

2.2.2. Livestock

- Provide clean and potable drinking water to animals round the clock.
- Clean the water trough regularly in livestock farm/shed.
- Provide mineral mixture @ 30-40 g/day to cattle for improving the milk production and reproduction efficiency.

2.2.3. Fisheries

- Measure turbidity of the pond water with the Secchi disc for maintenance of pond water transparency (30-45 cm).
- 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 (less than 10 ppm), and H₂S (0.002 ppm) in fish pond. For this aerate the ponds either by adding fresh water or by using aerators to maintain oxygen level in fish pond.

2.3. Soil Stresses

- **Orchards:** Avoid use of heavy machinery movement on wet soil near the plants to avoid soil compaction and suffocation of roots. Remove mulch cover on the bund/ basins and mix with the soil to improve the soil porosity.
- **Orchards:** Soil application and fertigation may not be possible due to rainy period. Foliar application of nutrition to be done to avoid deficiencies.

3. Managing Biotic Stresses

3.1. Crops

- **Maize:** Set up pheromone traps @ 20 traps ha⁻¹ for mass trapping of fall armyworm. Spray the crop with Azadirachtin at weekly interval @ 3 ml L⁻¹ of water. Under severe condition spray the crop with Emamectin benzoate @ 0.2 g L⁻¹ or Spinetoram 11.7% SC @ 2 ml L⁻¹ of water.
- **Sugarcane:** To manage white grubs set up light traps (preferably below neem tree if available) to attract white grub adults which emerge after receipt of rain. Apply fungal formulation of *Beauveria brongniartii* @ 2.5 kg ha⁻¹ mixed with FYM or press mud at the base of the clumps in the furrows. Drench the root zone of crop with Chlorpyrifos 20 EC @ 4.0 L ha⁻¹ or Quinalphos 25 EC @ 3.2 L ha⁻¹ three weeks after the adult emergence. Furrow application of insecticides such as, Thiamethoxam 25 WS @ 1.9 L ha⁻¹ or Fipronil 5 FS @ 2.0 L ha⁻¹.
- **Grape:** Spray Bordeaux mixture 1% or Copper oxy chloride @ 2.5 g L⁻¹ along with wettable sulphur 2g L⁻¹ during dry spell to avoid defoliation if pruning is to be delayed.
- **Custard apple:** Spray Mancozeb @ 2.0 g L⁻¹ to avoid blackening of fruits and spray Buprofezin 25 SC @ 1.25 ml L⁻¹ to manage mealybugs.
- **Sweet orange:** For control of fruit sucking moth and fruit fly pests dispose of damaged and fallen fruits immediately and spray Deltamethrin 2.8 EC @ 0.5 ml L⁻¹ or Azadirachtin 1% @ 1 ml L⁻¹.

- **Drumstick:** To control leaf eating caterpillar and bud worm spray Azadirachtin 1% @ 1 ml L⁻¹.
- **All vegetable crops:** It is necessary to follow integrated pest and diseases management practices since from the beginning such as the use of disease-free seedlings from the certified nurseries, field sanitation, use of mulching, sticky traps for sucking pests, and light traps for the lepidopteran pest. Use of environmentally safer pesticides like Spinosad (Lepidopteran) in eggplant and chilli, Spinetoram in chilli (thrips, fruit borer), and Neem oil of 10,000 ppm @ 1 ml L⁻¹ to manage sucking pests.
- **Biological Control Measures:** Use biological control agents like *Trichoderma viridae/harzianum*, *Pseudomonas fluorescence*, *Beauveria bassiana* and *Metarhizium anisopliae* through soil drenching and foliar spray, for management of various pests and diseases in orchards.

3.2. Livestock

- There is moderate risk of Black quarter (BQ) Disease in Dhule district. There is high risk of Haemorrhagic septicaemia (HS) in Ahmadnagar and moderate risk in Dhule district.
- In case of HS and BQ affected animals may be isolated and treated with suitable antibiotics and vaccination in consultation with the local veterinarians.
- There is very high risk of Foot and Mouth Disease (FMD) in Pune, Sangli, Latur and Yavatmal districts and high risk in Satara, Solapur, Sindhudurg and Osmanabad districts.
- There is very high risk of Peste des Petits Ruminants (PPR) in Ahmadnagar, Amaravati, Dhule and Nashik districts and high risk in Aurangabad district.
- Vaccination for FMD and PPR (animals above 3 month of age) may be done in consultation with the local veterinarians and as advised by state animal husbandry authorities.
- There is high risk of Sheep and Goat Pox disease in Kolhapur district.
- There is very high risk of Theileriosis disease in Akola district.
- Care needs to be taken to close all cracks and crevices by roughcasting and smoothing of the outer and inner surfaces of cattle sheds for the eradication of the ecto-parasites from the farm.
- Monitor animals for any sickness particularly related to digestive, dermal or respiratory problems and treat them by consulting veterinarian.
- 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 veterinarian.
- Spot the sick animals isolate them in separate shed for treatment.
- Avoid standing water near sheds to control mosquitoes and flies.

Lumpy Skin Disease (LSD) Advisory

- Recently a disease with nodular skin lesions and mild to severe illness is being reported in cattle and buffaloes from different parts of Maharashtra. It is Lumpy skin disease (LSD), which is a viral disease with no specific treatment. However, symptomatic and supportive treatment should be carried out with the help of a local veterinarian.
- Vaccination of animals should be done with the consultation of a local veterinarian based on priority decided by state Government authorities.
- LSD affected animals need to be separated from non-affected animals and should be kept in strict isolation and monitoring under veterinary supervision.
- Strict control measures need to be taken for control of Mosquitoes and other biting insects in the surroundings of livestock.

4. Other advisories

4.1. Crops

- **Pigeon pea / Soybean/ Green gram/ Black gram:** Ensure weed free environment in crops.
- **Kharif crops:** Matured crops should be harvested and kept at safe place for sun drying and threshing.
- **Grape:** Carry out frequent de-suckering and remove extra shoot growth to avoid depletion of stored food and to avoid foliar diseases.
- **Dragon fruit:** Manual pollination is highly recommended to improve fruit set and quality when flowering coincides with continuous overnight rains. Red flesh types respond extremely well to cross pollination as much of them are self-incompatible.
- **Vegetables:** The seedlings should be procured from the nursery at the proper growth stage that is healthy and disease-free, with proper stem girth at 20-25 cm height in case of solanaceous vegetables.

4.2. Fisheries

- 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 water holding capacity throughout the year.
- Apply cow dung @ 0.75-1.0 t ha⁻¹ after lime application in corner of the pond.
- Cow dung, urea and SSP should be applied only after pond filled with water.
- Apply powdered lime in pond bottom @ 120-130 kg ha⁻¹ and after 10 days of lime application water may be filled in the fish pond.

5. Covid-19 Advisory

- For prevention of Covid-19 follow the latest advisories provided by state health authorities.

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