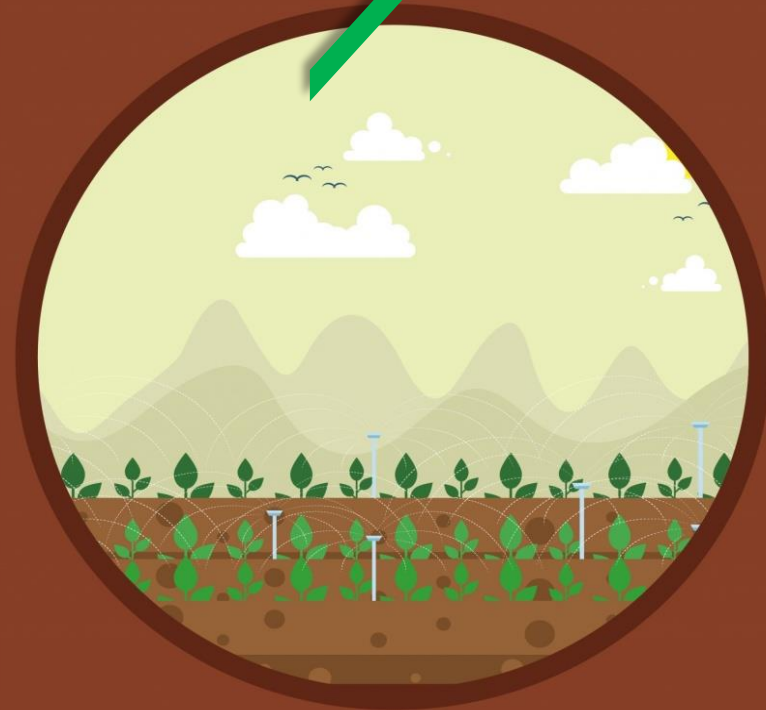




Stress Management Agro Advisory for the State of Maharashtra

October 01-14, 2021



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Managing Abiotic and Biotic Stresses in Agriculture

Agro-Advisory for the State of Maharashtra

(October 01-14, 2021)

Advisory No.: NIASM/MH/21-21

Date: September 30, 2021

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

1.1. Rainfall

- Rainfall may remain 2-5 mm/day above normal in most parts of the state in both the weeks.
- In the first week, the Konkan and the Vidarbha region may receive rainfall 10-20 mm/day and in the remaining parts of the state it may vary between 5-10 mm/day, while in the second week in most parts of the state may receive rainfall 5-10 mm/day.

1.2. Temperature

- Maximum temperature may remain up to 3°C below normal in the most parts of the state. In the first week it may vary between 28-32 °C, while in the second week it may remain between 30-34 °C.
- Minimum temperature may vary between 20-24 °C. It may remain up to 2 °C above normal in the most parts of the state, while it may remain up to 1 °C below normal in the Konkan and southern parts of the Madhya Maharashtra.

2. Managing Abiotic and Biotic Stresses

2.1. Atmospheric Stresses

2.1.1. Crops

- **Dragon fruit:** Follow manual pollination to increase fruit set when rains coincide with flowering.
- **Grape:** If stress before pruning was not induced due to continuous rains and sufficient soil moisture use Ethephon 39SL @ 0.1% for ease in defoliation prior to pruning. Carry out forward pruning after ascertaining some dry period.
- **Orchards:** New planting shall be done to take advantage of rains and favourable climatic conditions. Protect the newly planted seedlings from heavy rainfall and strong winds by providing support with bamboo sticks.

2.1.2. Livestock

- The floor of the animal shed should be kept dry and clean to avoid udder related diseases in animals.
- Keep the animals indoor during thunderstorm/ lightening events.

2.2. Water Stresses

2.2.1. Crops

- **Pigeon pea:** Care should be taken to avoid waterlogging condition.
- **Orchards:** Keep open drainage channels in orchards to avoid water stagnation as heavy rains are expected during return monsoon.
- **Vegetable crops:** Raised beds/ridges for planting to be preferred to avoid damage due to waterlogging and better root aeration. Light irrigation during dry spells to be given through

drip irrigation while ensuring mulching to reduce direct evaporation of soil moisture and weeds/pests/diseases.

2.2.2. Livestock

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

2.2.3. Fisheries

- Monitor the water quality parameters viz. dissolved oxygen (6.0-7.5 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 carefully.

2.3. Soil Stresses

- **Grape:** Soil application of FYM @ 25 metric ton and SSP @ 200 Kg ha⁻¹ should be given 8-10 days before pruning. Other nutrient requirements can be achieved through fertigation.
- **Pomegranate:** During dry spell pulverize the soil in basins immediately and apply FYM treated with *Trichoderma* as a biological control measure against root rot due to heavy moisture during rainy period.
- **Saline soil:** In case of saline soils make provision for proper drainage so that rain water can wash away the excess salt.
- **Waterlogging condition:** If there are symptoms of nutrient deficiency due to waterlogging spray 0.3-0.5% KNO₃ on foliage for faster recovery.

2.4. Biotic Stresses

2.4.1. Crops

- **Maize:** Set up pheromone traps @ 20 traps ha⁻¹ for managing 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:** 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 for controlling white grubs.
- **Guava and dragon fruit:** For fruit fly management set up methyl eugenol para-pheromone traps @ 20 traps ha⁻¹. Spray the orchard with Azadirachtin at weekly interval @ 3 ml L⁻¹ of water to repel the flies visiting the orchard for oviposition. Spray Malathion 50 EC @ 2 ml L⁻¹ and Dimethoate 30 EC @ 1 ml L⁻¹ during fruit growth if higher pest population exists.
- **Guava:** Anthracnose characterized by small pin-head sized spots on the unripe fruits gradually enlarges to form sunken and circular, dark brown to black spots. For managing this, avoid too much waterlogging around the trees. Spray Mancozeb 75% WP @ 2.5 g L⁻¹ or Copper oxy chloride 50% WP @ 2.5 g L⁻¹.
- **Sapota:** For leaf webber (chiku moth) and hairy caterpillar management spray two rounds of, Quinalphos 0.05 % at 20 days' interval after new shoot formation. For managing leaf spot infestation, spray Mancozeb @ 0.25% or Copper oxychloride 0.2%.
- **Grape:** Spray Bordeaux mixture 1% immediately after pruning followed by Imidachloprid 200 SL @ 0.8 ml L⁻¹, to control damage of sprouting buds by flea beetle. Keep ready the chemicals required for prophylactic spraying for downy mildew control during shoot development.
- **Pomegranate:** For fungal leaf spot and fruit rot management, spray of Bordeaux mixture 0.5% or Copper oxychloride 50% WP @ 2.5-3.0 g L⁻¹ followed by 2-bromo, 2-nitro propane-1, 3-diol (Bronopol 95%) @ 0.5 g L⁻¹ spray can be taken at 10 days' interval. For Bacterial leaf

blight management, spray of streptomycin sulphate + tetracycline hydrochloride 10% (Streptocycline) @ 0.5 g L⁻¹ once a month and at 7-10 days' interval from Bronopol.

- **Citrus:** For brown fruit rot management spray 1% Bordeaux mixture or Copper oxychloride @ 3 g L⁻¹.
- **Custard apple:** To control mealy bugs adults and crawlers, spray at the initial stage or when pest population is lower spray with soap solutions or fish oil rosin soap (FORS) neem oil 5 ml L⁻¹ may be carried out to dissolve the waxy layer secreted by the mealybugs. In case of higher pest occurrences spray Imidacloprid or Acetamiprid @ 1-2 ml L⁻¹. Prophylactic sprays of neem oil and systemic insecticides (Imidacloprid or Acetamiprid or Dichlorovos) shall be taken to avoid pest occurrence.
- **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 3 weeks.
- **Vegetable crops:** Integrated management of pest and diseases practices to be followed for this healthy and disease-free seedlings of should be procured from certified nursery is pre-requisite. For disease management application of preventive spray of liquid *Trichoderma sp.* formulation @ 5 ml L⁻¹ and application of *Trichoderma sp.* + *Pseudomonas sp.* @ 1 ml L⁻¹ through drip irrigation system to manage soil borne pathogens. Use of systemic insecticides like Imidacloprid @ 0.5 ml L⁻¹ to manage sucking pest in vegetable crops.

2.4.2. Livestock

- There is very high risk of Peste des Petits Ruminants (PPR) in Ahmednagar, Dhule and, Nashik districts; and high risk in Aurangabad district of Maharashtra. Very low risk of Foot and Mouth Disease (FMD) is prevailing in majority of districts. Vaccination for PPR and FMD (animals above 3 month of age) may be done in consultation with the local veterinarians and as decided by state animal husbandry authorities.
- There is very high risk of *Haemorrhagic septicaemia* (HS) in Thane district and high risk in Ahmednagar, Dhule and Nashik districts. Black Quarter (BQ) is having very high risk in Dhule district. There is very high risk of Sheep and Goat Pox in Kolhapur and Sangli districts. Vaccination may be done in consultation with the local veterinarians.
- There is very high risk of Theileriosis in Akola district.
- Care need to be taken to close all cracks and crevices by roughcasting and smoothing of the outer and inner surfaces of the cattle sheds for the eradication of the parasite from the farm.
- Vaccinate the left-over livestock for *Haemorrhagic septicaemia* (HS), Black quarter (BQ) and Sheep and Goat Pox with the consultation of local veterinarians.
- 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.
- Deworm livestock at least 15 days before vaccination with broad spectrum anthelmintic for optimum benefits.
- Spot the sick animals isolate them in separate shed for treatment.

2.5 Other specific advisory

2.5.1. Crops

- **Green gram/Black gram:** Carry out the harvesting of matured pods (75% dried) in early sown green gram/black gram crop and keep them at safe place.
- **Brinjal:** Use of grafted seedlings to address the issues associated with abiotic and biotic stresses.

2.5.2. Livestock

- Feed colostrum to new born calves within (highly useful 15- 30 minutes) 2 hours for higher absorption in the body @ 1/10th of body weight for five days.
- Observe for complete expulsion of placenta in calved animals. If the placenta is not expelled within 6-12 hours of parturition, take the help of local veterinarian.
- The floor of the animal shed should be kept dry and clean to avoid udder related diseases in animals.
- The feed and fodder should be stored properly to prevent the growth of moulds.
- Maintain hygiene around animal shed and remove the unwanted vegetation nearby the sheds.
- Protect young animals from excessive consumption of newly grown green vegetation; add dry roughages along with green fodder.
- Prepare silage if extra green forages (maize, jowar and grasses) are available.

2.5.3. Fisheries

- Feed may be provided to fingerlings at the rate of 4-5 % of body weight thrice a day, morning, noon and evening for good growth of fingerlings fish.
- Protein inclusion of 30-35 % may be used in the fish feed for proper growth maintenance of the fingerlings fish.
- Time to time the growth of the fingerlings may be checked for better maintenance of fish stock and diseases protection.
- The unutilized feed in the feeding tray may be checked frequently to standardise the feed rate.

3. Covid-19 Advisory (Ministry of Agriculture, Govt. of India)

3.1. Precautionary Measures for Agricultural Activities

- Strictly follow social distancing and avoid contacts with persons migrated from red quarantined zones.
- In manual field operations of harvesting/picking, accomplish the operation in 4-5 feet spaced strips assigning one strip to one person.
- Stagger the field operations wherever possible.
- Prefer mechanized operations over the manual wherever feasible.
- All machines should be sanitized at the entry point and at regular intervals.
- All transport vehicles, gunny bags or other packaging material should be sanitized.

3.2. Livestock and Poultry

- Wash hands with soap and water before and after milking of lactating animals and clean the utensils thoroughly.
- Don't allow visitors to enter animal premises and use mask and maintain social distancing while distribution/sell of milk.
- Use of hand sanitizer or washing hands frequently need to be practiced routinely while carrying out various day to day operations.
- All the bio-security measures need to be followed strictly in the poultry farms.

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