



# *National Agromet Advisory Service Bulletin*

**Friday 15<sup>th</sup> December 2017**  
**(For the period 15<sup>th</sup> to 20<sup>th</sup> December 2017)**



**Issued by**  
**India Meteorological Department**

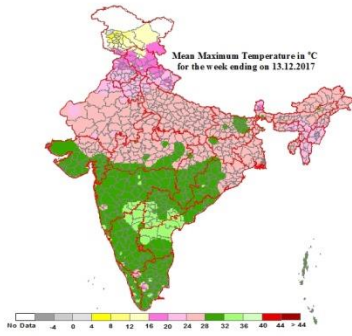
**Weblink For**

**District AAS Bulletin:** <http://www.imdagrimet.gov.in/node/3545>

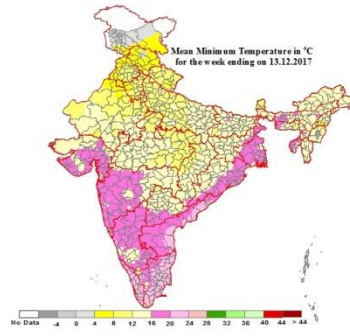
**State Composite AAS Bulletin:** <http://www.imdagrimet.gov.in/node/3544>

**Spatial distribution of weather parameters for the week ending 13.12.2017**

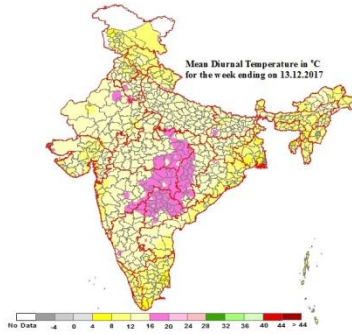
**Mean Maximum Temperature (°C) for the week ending 13.12.2017**



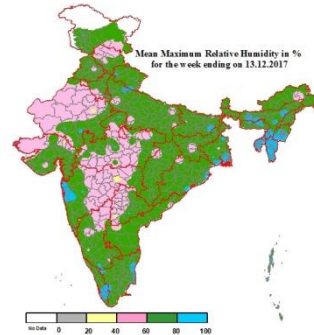
**Mean Minimum Temperature (°C) for the week ending 13.12.2017**



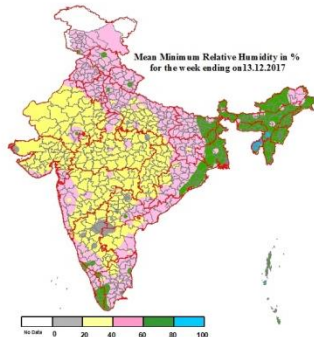
**Mean Diurnal Temperature Variation (°C) for the week ending 13.12.2017**



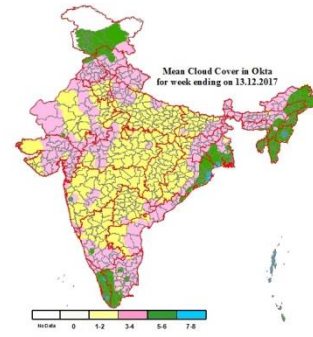
**Mean Maximum Relative Humidity (%) for the week ending 13.12.2017**



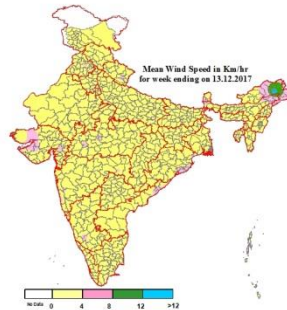
**Mean Minimum Relative Humidity (%) for the week ending 13.12.2017**



**Mean Cloud Cover (okta) for the week ending 13.12.2017**



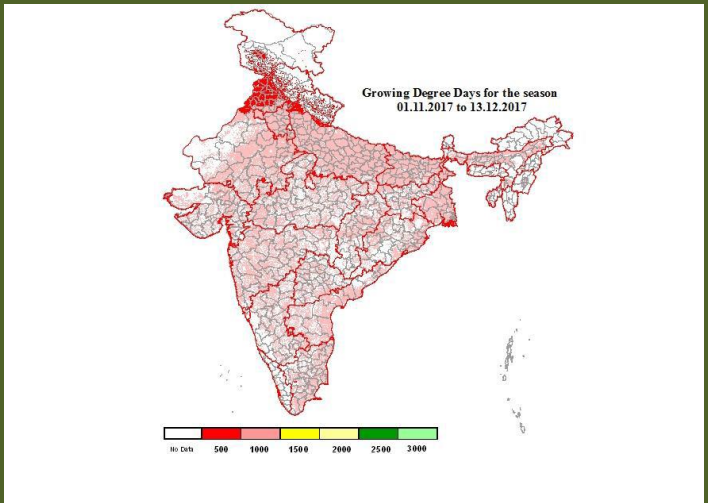
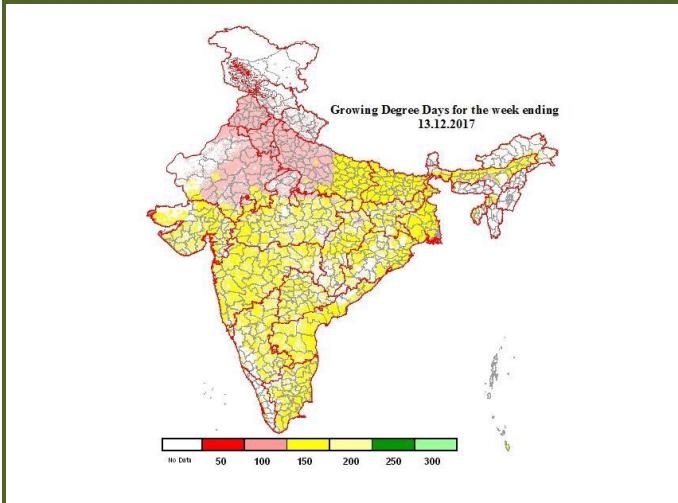
**Mean Wind Speed (km/hr) for the week ending 13.12.2017**





**Growing Degree Days for the week ending 13.12.2017**

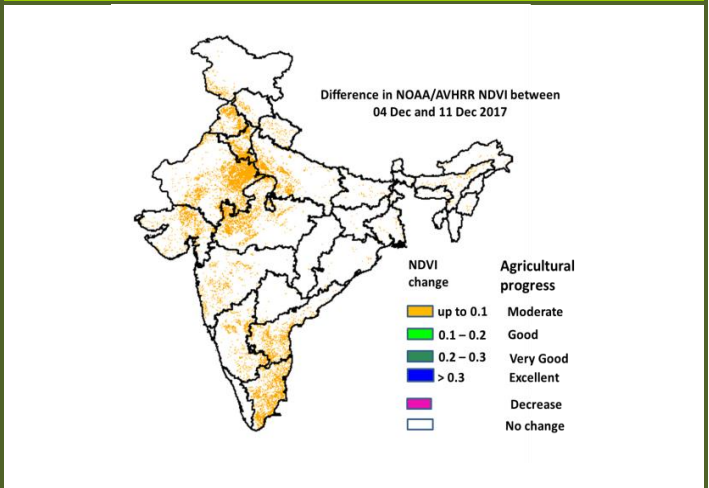
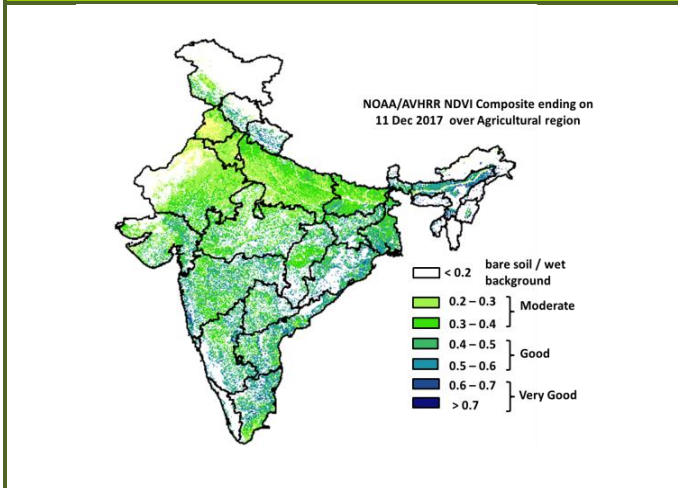
**Growing Degree Days for the season ending 13.12.2017**



\* Base temperature for *Rabi* Season is taken as 05<sup>0</sup> C

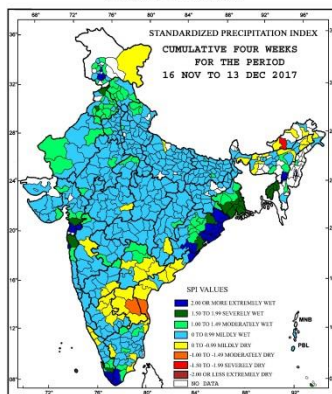
**NOAA/AVHRR NDVI composite ending on 11<sup>th</sup> December 2017 over Agricultural regions of India**

**Difference in NOAA/AVHRR NDVI between 4<sup>th</sup> and 11<sup>th</sup> December 2017**

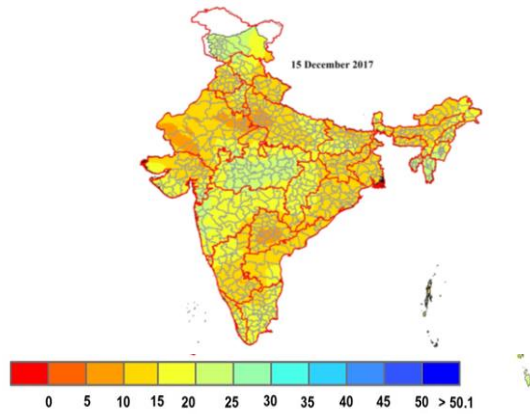


**Standardised Precipitation Index  
Cumulative 4 weeks for the period 16<sup>th</sup> November to 13<sup>th</sup> December 2017**

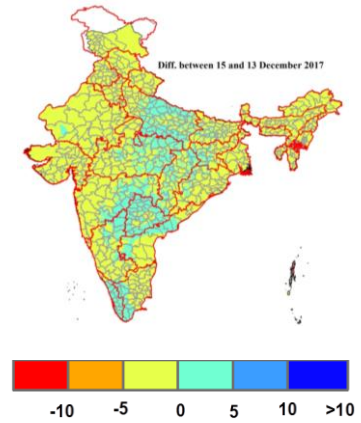
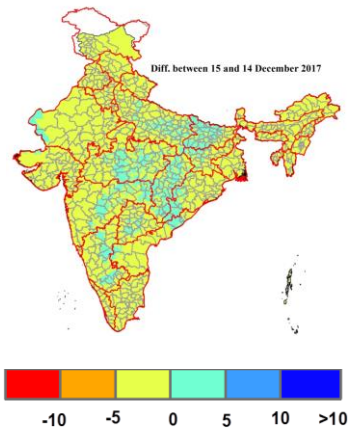
MINISTRY OF EARTH SCIENCES  
INDIA METEOROLOGICAL DEPARTMENT  
HYDROMET SECTION, PUNE



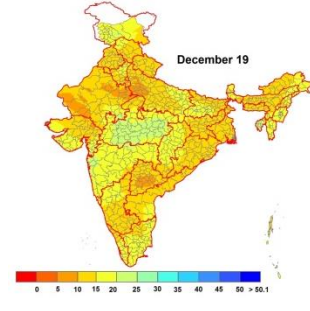
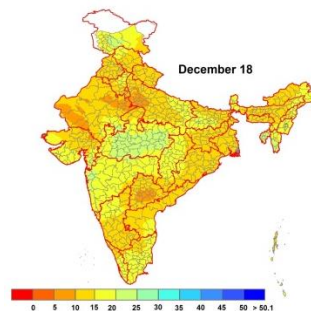
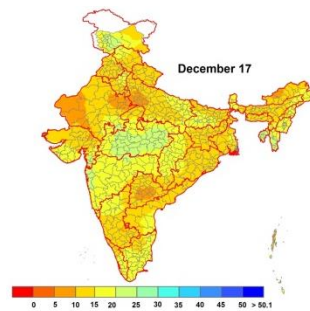
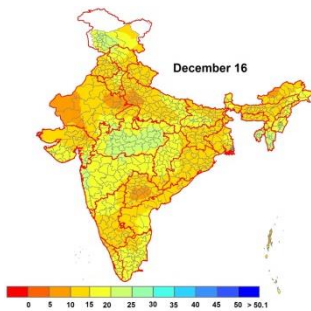
**Daily Soil Moisture (mm) for 15<sup>th</sup> December 2017 (ending at 0830 IST) for 60 cm depth**

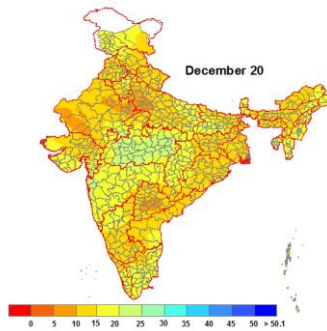


**Difference of Soil Moisture (mm) for 60 cm depth**



**Forecasted Soil Moisture (mm) from 16<sup>th</sup> December to 20<sup>th</sup> December 2017 (ending at 0830 IST) for 60 cm depth**





### Weather Forecast for next 5 days valid upto 0830 hours of 20<sup>th</sup> December 2017

- Meteorological subdivision wise detailed 5 days rainfall forecast is given in Table below.
- Minimum temperatures very likely to fall by 2-3°C over Punjab, Haryana, Chandigarh & Delhi, West Uttar Pradesh, Rajasthan and Gujarat during next 3-4 days, thereby resulting in likely occurrence of cold wave conditions over some more parts of northwest, West & Central India.
- Minimum temperatures are also likely to fall by 2-3°C over East India during next 2-3 days. No significant change is likely over the rest of the country during next 3-4 days.
- Shallow to moderate fog at isolated places very likely over West Bengal, interior Odisha and north Madhya Pradesh in the morning hours of during next 2 days.

#### 5 Day Rainfall Forecast (Mid day) 15<sup>th</sup> December 2017

Met-Sub-Division	15-Dec Today	16Dec Sat	17Dec Sun	18Dec Mon	19Dec Tue
1. Andaman & Nicobar Islands	ISOL	ISOL	SCT	SCT	ISOL
2. Arunachal Pradesh	DRY	DRY	DRY	DRY	DRY
3. Assam & Meghalaya	DRY	DRY	DRY	DRY	DRY
4. N. M. M. & T.	DRY	DRY	DRY	DRY	DRY
5. S.H. West Bengal & Sikkim	DRY	DRY	DRY	DRY	DRY
6. Gangetic West Bengal	DRY	DRY	DRY	DRY	DRY
7. Odisha	DRY	DRY	DRY	DRY	DRY
8. Jharkhand	DRY	DRY	DRY	DRY	DRY
9. Bihar	DRY	DRY	DRY	DRY	DRY
10. East Uttar Pradesh	DRY	DRY	DRY	DRY	DRY
11. West Uttar Pradesh	DRY	DRY	DRY	DRY	DRY
12. Uttarakhand	DRY	DRY	DRY	DRY	DRY
13. Haryana, Chd & Delhi	DRY	DRY	DRY	DRY	DRY
14. Punjab	DRY	DRY	DRY	DRY	DRY
15. Himachal Pradesh	ISOL	DRY	DRY	DRY	DRY
16. Jammu & Kashmir	ISOL	ISOL	ISOL	ISOL	ISOL
17. West Rajasthan	DRY	DRY	DRY	DRY	DRY
18. East Rajasthan	DRY	DRY	DRY	DRY	DRY
19. West Madhya Pradesh	DRY	DRY	DRY	DRY	DRY
20. East Madhya Pradesh	DRY	DRY	DRY	DRY	DRY
21. Gujarat Region	DRY	DRY	DRY	DRY	DRY
22. Saurashtra & Kutch	DRY	DRY	DRY	DRY	DRY
23. Konkan & Goa	DRY	DRY	DRY	DRY	DRY
24. Madhya Maharashtra	DRY	DRY	DRY	DRY	DRY
25. Marathwada	DRY	DRY	DRY	DRY	DRY
26. Vidharbha	DRY	DRY	DRY	DRY	DRY
27. Chhattisgarh	DRY	DRY	DRY	DRY	DRY
28. Coastal Andhra Pradesh	DRY	DRY	DRY	DRY	DRY
29. Telangana	DRY	DRY	DRY	DRY	DRY
30. Rayalaseema	DRY	DRY	DRY	DRY	DRY
31. Tamilnadu & Puducherry	ISOL	ISOL	ISOL	ISOL	ISOL
32. Coastal Karnataka	DRY	DRY	DRY	DRY	DRY
33. North Interior Karnataka	DRY	DRY	DRY	DRY	DRY
34. South Interior Karnataka	DRY	DRY	DRY	DRY	DRY
35. Kerala	ISOL	ISOL	DRY	DRY	DRY
36. Lakshadweep	ISOL	ISOL	DRY	DRY	DRY

#### % Station Reporting Rainfall

% Stations	Category	% Stations	Category
76-100	Widespread (WS/Most Places)	26-50	Scattered (SCT/ A Few Places)
51-75	Fairly Widespread (FWS/ Many Places)	1-25	Isolated (ISOL)
No Rain	Dry		

### Weather Warning during next 5 days

- **15 December (Day 1):** Dense to very dense fog at a few places very likely over Punjab, Haryana, West Uttar Pradesh, north Rajasthan and at isolated places over Nagaland, Manipur, Mizoram & Tripura; dense fog at isolated places over Jammu division of Jammu & Kashmir, lower regions of Himachal Pradesh and Uttarakhand and moderate to dense fog at isolated places over Sub-Himalayan West Bengal and Assam & Meghalaya. Cold wave conditions very likely at isolated places over lower regions of Jammu & Kashmir, Himachal Pradesh and over Punjab, Haryana, West Uttar Pradesh and West Rajasthan. Cold day conditions are very likely at isolated places over Punjab, Haryana, north Rajasthan and West Uttar Pradesh.
- **16 December (Day 2):** Dense fog at isolated places very likely over Punjab, Haryana and north Rajasthan; Moderate to dense fog at isolated places over Jammu division of Jammu & Kashmir, Himachal Pradesh, Uttarakhand and West Uttar Pradesh, Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal and Assam & Meghalaya. Severe cold wave conditions are at isolated places very likely over Punjab, Haryana and West Rajasthan and cold wave conditions at isolated places over Jammu & Kashmir, Himachal Pradesh, West Uttar Pradesh and East Rajasthan. Cold day conditions at isolated places very likely over Punjab, Haryana, north Rajasthan and West Uttar Pradesh.
- **17 December (Day 3):** Moderate to dense fog at isolated places very likely at isolated places over Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Punjab, Haryana, north Rajasthan, Uttar Pradesh, Nagaland, Manipur, Mizoram & Tripura and Assam & Meghalaya. Severe cold wave conditions at isolated places very likely over north Rajasthan and cold wave conditions at isolated places over Punjab, Haryana and Uttar Pradesh.
- **18 December (Day 4):** Moderate to dense fog at isolated places very likely over Punjab, Haryana, north Rajasthan, Uttar Pradesh, Nagaland, Manipur, Mizoram and Tripura. Severe cold wave conditions at isolated places very likely over north Rajasthan and cold wave conditions at isolated places over Punjab, Haryana and West Uttar Pradesh.
- **19 December (Day 5):** Moderate to dense fog at isolated places very likely over Punjab, Haryana, north Rajasthan and Uttar Pradesh. Severe cold wave conditions at isolated places very likely over north Rajasthan and cold wave conditions at isolated places over Punjab, Haryana and West Uttar Pradesh.

### Weather Outlook for subsequent 2 days from 20<sup>th</sup> to 22<sup>nd</sup> December 2017

- Minimum temperatures very likely to prevail below normal by 2-3°C over many parts of northwest, central and adjoining East India.
- Rainfall at isolated places likely over southern most peninsular India and Andaman & Nicobar Islands.
- Weather is likely to be dry over the remaining parts of the country.

### Salient Advisories

- As severe cold wave conditions very likely at isolated places over **Punjab, Haryana and West Rajasthan** on 16<sup>th</sup>, over **north Rajasthan** from 17<sup>th</sup> to 19<sup>th</sup>, cold wave conditions very likely at isolated places over lower regions of **Jammu & Kashmir, Himachal Pradesh** and over **Punjab, Haryana, West Uttar Pradesh and West Rajasthan** on 15<sup>th</sup>, **Jammu & Kashmir, Himachal Pradesh, West Uttar Pradesh and East Rajasthan** on 16<sup>th</sup>, over **Punjab, Haryana and Uttar Pradesh** from 17<sup>th</sup> to 19<sup>th</sup> December, apply light and frequent irrigation /sprinkler irrigation in the evening to protect the crops from frost /cold injury. To protect young fruit plants from chilly winds, cover young fruit plants with straw/polythene sheets/gunny bags.
- As dense to very dense fog at a few places very likely over **Punjab, Haryana, West Uttar Pradesh, north Rajasthan** from 15<sup>th</sup> to 17<sup>th</sup>, dense fog at isolated places over **Jammu division** of Jammu & Kashmir, lower regions of **Himachal Pradesh** and **Uttarakhand** on 15<sup>th</sup>, Moderate to dense fog at isolated places over Jammu division of Jammu & Kashmir, Himachal Pradesh, Uttarakhand and West Uttar Pradesh on 16<sup>th</sup>, Moderate to dense fog at isolated places very likely at isolated places over Jammu & Kashmir, Himachal Pradesh and Uttarakhand on 17<sup>th</sup>, over **Punjab, Haryana, north Rajasthan, Uttar Pradesh** from 17<sup>th</sup> to 19<sup>th</sup> December, dense to very dense fog/moderate to dense fog at isolated places very likely over **Nagaland, Manipur, Mizoram & Tripura** from 16<sup>th</sup> to 18<sup>th</sup> and moderate to dense fog at isolated places very likely over **Assam & Meghalaya** from 15<sup>th</sup> to 17<sup>th</sup> December, monitor the standing crops for incidence and spread of pest diseases, tomato and



onion crops for early/late blight disease. If symptoms are noticed, undertake plant protection measures.

- In **South Telangana Zone**, to overcome cold injury and for better nursery growth in rice, adopt the following measures: Cover the nursery beds with polythene sheet during night and remove in the morning. Irrigate the nursery bed every day in the evening and let out the water in the morning.
- As dry weather would prevail, continue harvesting of Sali rice in **Assam, Meghalaya** and picking of cotton in **Gujarat and North Interior Karnataka**.
- In **Punjab**, in view of the cold wave/severe cold wave conditions, keep the animals inside the sheds during night and provide dry bedding and use heaters inside cattle sheds to protect them from cold. Increase protein level and minerals in the feed concentrate to keep the animals healthy to cope up with the situation. In **Jammu & Kashmir**, give special care to young calves as they are more sensitive to pneumonia. Protect the pregnant and milch animals from cold and feed them mineral mixture regularly. Put some bedding material like *puaal* etc. to keep animals warm. Provide dry bedding during night. Do not allow animals to leave khurli early in morning directly to open area. In Poultry, keep the chicks warm by providing artificial light in the poultry sheds.

### *Detailed Zonewise Agromet Advisories*

#### **SOUTH INDIA [TAMIL NADU, TELANGANA, ANDHRA PRADESH, KARNATAKA, KERALA]**

- **Realised Rainfall:** Rainfall occurred in Kanyakumari, Tirunelveli, Thoothukudi and Virudhnagar districts of Tamil Nadu, Kollam and Pathanamthitta districts of Kerala and weather remained mainly dry/dry over rest of the region during the week
- **Advisories:**
  - **Kerala:**
    - In the Problem Area Zone, carry out hand weeding and maintain 5 cm water level in rice fields. Continue harvesting of mature nutmeg fruits. In the Southern Zone, undertake harvesting of ginger.
    - In the Problem Area Zone, control fungal diseases in nutmeg by spraying 1 % Bordeaux mixture. Spray starch solution for white fly attack in coconut. Spray Copper Oxy-Chloride 3g/ litre on new sprouts in newly planted rubber gardens.
    - In the Southern Zone, low temperature and dry weather may trigger the spread of blast disease in paddy during panicle initiation stage. To control this spray propiconazole (Tilt) / hexaconazole(contaf) 1 ml/ 1 litre of water. Apply Imidachloprid 3ml/10 L for severe attack of stem borer in paddy. To control fungal diseases in rubber plants, spray copper oxy chloride or Bordeaux mixture. The weather conditions may favour the multiplication of white flies which act as vectors for spreading crinkling in cucurbits especially bitter melon. Spraying of neem oil + castor oil – garlic emulsion is an effective control measure. In case of severe attack spray Dimethoate(Rogor) 30 EC, 1.5 ml/1 litre of water.
    - In the Northern Zone, in case of case worm, drain out water from paddy field and, if the infestation is severe apply Takumi® @ 3g/10 litres OR spray Quinalphos @ 2ml/litre. If blast disease is seen in paddy, apply Carbendazim @ 2g/litre. Spray Flubendiamide @ 1.5 ml in 10 litres of water 2-3 times at weekly interval for shoot and fruit borer in brinjal. Spray Mancozeb @ 3g/l of water at weekly intervals for Downy mildew on cucurbits.
  - **Andhra Pradesh:**
    - In the North Coastal Zone, continue sowing of black gram and green gram.
    - In the Scarce Rainfall Zone, provide light irrigation to mango plantation for timely flowering.
    - In the North Coastal Zone, spray Chlorpyrifos @ 2.5 ml/litre or Acephate @ 1.5 g/litre for aphids and maruca pod borer in red gram. Spray Acephate @ 1.5 g/litre + Carbendazim @ 1 g/litre for sucking pests and pink ball worm in cotton crop. For control of sucking pests and leaf webber in groundnut crop, spray neem oil @ 5 ml/litre.
    - In the Scarce Rainfall Zone, prevailing conditions are favorable for incidence of spotted pod borer and helioverpa in red gram, spray Chlorpyrifos @ 1.5ml/ Novaluron @ 1ml / Flubendiamide @ 0.2 ml + Nuvan @ 1ml per one litre of water. For the incidence of bacterial wilt and fungal disease in pomegranate, spray Carbendazim @ 1 g/lit + Streptomycin 0.5 g/1 lit of water is recommended. For the incidence of pink boll worm incidence in cotton crop, spray 5 % NSKE or neem oil at flowering stage to prevent egg laying. If Incidence was noticed immediately spray Quinalphos @ 2ml/lit or Chlorpyrifos @ 2.5 ml/ lit or Thiodicarb @ 1.5 g/lit is recommended.
    - In the Krishna Godavari Zone, for BPH incidence in paddy, spray Acephate 1.5 g or Monocrotophos 2.2 ml or Buprofezin 1.6 ml or Pymetozin 0.6g or Thiamethoxam 2.2 ml or Fenobucarb 2.0 ml per litre of water.

▪ **Telangana:**

- In North Telangana Zone, continue sowing of Rabi rice in nursery beds. Cover entire nursery bed with polythene sheets at night and remove in the morning to avoid the effect of cool temperatures on germination and growth. Provide irrigation during flowering and grain filling stage in sorghum crop, two irrigations at flower initiation stage in Bengal gram crop and one irrigation at pod development stage in red gram crop.
- In South Telangana Zone, to overcome cold injury and for better nursery growth in rice, adopt the following measures. Cover the nursery beds with polythene sheet during night and remove in the morning. Irrigate the nursery bed every day in the evening and let out the water in the morning.
- In North Telangana Zone, spray Methyl-o-demeton or Dimethoate or Malathion 5% @ 2 ml per litre of water for aphids in sorghum crop. Spray Monocrotophos @ 1.6 ml/ litre of water for leaf folder and Dimethoate @ 2.0 ml or Monocrotophos @ 1.6 ml/ litre for Aphids/Jassids in red gram. Spray monocrotophos @ 1.6 ml/l or Acephate @ 1.5 g/l or Quinalphos @ 2 ml/l or Thiodicarb @ 1 g/litre for spodoptera in Bengal gram crop. Spray Chlorothalonil @ 2 g/l or Tebuconazole @ 1 ml/l for tikka leaf spot in groundnut crop. Spray Chlorothalonil @ 2 g or Pyraclostrobin @ 1g/ liter of water for early blight in tomato crop.

▪ **Tamil Nadu:**

- In the Western Zone, since light rainfall is expected, carry out picking cotton kapas during sunny days and stored separately for getting better price. Harvest early planted Samba rice and turmeric rhizomes.
- In the Southern Zone, prevailing current weather condition give rise to incidence of Pink bollworm in Cotton. Spray Triazophos 40 EC 2.5 l/ha or Phosalone 35% EC 2 l /ha.
- In the Western Zone, because of low temperature and high relative humidity, infection from bacterial leaf blight is expected in rice crop. To control, spray Streptomycin sulphate + Tetracycline combination 300 g + Copper oxychloride 1250 g/ha or Copper hydroxide 2g/lit of water or 20% cow dung (2 kg cow dung may be mixed with 10 lit of water soaked overnight and filter). If necessary repeat after 15 days.

▪ **Karnataka:**

- In Central Dry Zone, continue nursery preparation for summer ragi (Indof-7 and Indof-15 varieties) under irrigation.
- In North Dry Zone, if irrigation facility is available, provide irrigation to chick pea (before flowering) and wheat crops. Undertake intercultural operations in already sown *rabi* crops.
- In Eastern Dry Zone, clear the weeds in mango, guava, sapota orchard and use it as mulch. Deep ploughing is recommended in mango orchard to minimize the pest and disease incidence in next season.
- In Southern Dry Zone, continue harvesting of rice, ragi and other crops.
- In Southern Transition Zone, complete harvesting of matured rice, ragi, maize cobs and matured sugarcane. Undertake sowing of short duration pulses like horse gram, chickpea, green gram and black gram (after harvest of rice and maize crops), wherever soil moisture is there or availability of one irrigation facility is there.
- In North East Transition Zone, continue plantation of sugarcane (variety Co-86032) crop; adopt paired row system of planting.
- In North East Dry Zone, undertake land preparation for transplanting of summer rice. Undertake third picking of seed cotton in early sown cotton crop. Take up second picking of seed cotton in late sown cotton.
- In North Transition Zone, undertake intercultural operations in sorghum, wheat (30 days old crop) and Bengal gram. Provide irrigation at critical stages in pigeon pea (flowering), wheat and sorghum.
- In Southern Dry Zone, due to cloudy weather, infestation of mites, thrips and white flies is noticed in vegetable crops; for control, spray Chloropyriphos @ 2 ml/litre of water in clear weather.
- In North East transition Zone, application of Lambda Cyaloholothrin @ 1ml/liter of water to protect the sorghum crop from the menace of Army worm is recommended.
- In North East Dry Zone, spray Rogor (Dimethoate) 2 ml/liter of water on a non-rainy day to avoid the pod fly damage which was noticed in pigeon pea.
- In Southern Dry Zone, infestation of blast disease was noticed in late sown ragi and rice crop; spray Tricyclovoal @ 0.6 g/litre of water for control. Due to cloudy weather, infestation of mites, thrips and white flies is noticed in vegetable crops; for control, spray Chloropyriphos @ 2 ml/litre of water.
- In North Transition Zone, if fruit borer is noticed in tomato, spray Thiodicarb 75WP @ 1gm / litre of water.
- In Coastal Zone, in black pepper vines, spray Copper-oxy-Chloride @ 3gm/litre and drench the soil with same chemical 2 litre solution near the vine.

• **Animal Husbandry**

- In the Problem Area Zone of Kerala, ensure dry conditions in cattle shed to prevent incidence of foot rot.
- In North and South Telangana Zones, treat /vaccinate animals against FMD and HS; vaccinate sheep/goat against sheep pox disease and vaccinate poultry birds against Ranikhet disease.
- In the Western and Southern Zones of Tamil Nadu, provide nutritious feed to dairy animals. In North Dry Zone of Karnataka, vaccinate (ET vaccine) sheep and goats against Enterotoxemia. Give de-worming medicine to livestock under the supervision of veterinary doctor.



## NORTHEAST INDIA [ARUNACHAL PRADESH, NMM&T, ASSAM, MEGHALAYA]

- **Realised Rainfall:** Rainfall occurred in Cachar, Hailakandi, Karimganj districts of Assam, East Khasi Hills district of Meghalaya, Aizwal, Lunglei and Serchhip districts of Mizoram, Imphal East and Imphal West districts of Manipur, Dimapur and Kohima districts of Nagaland, all Districts of Tripura and weather remained mainly dry/dry over rest of the region during the week.
- **Advisories:**
  - As dense to very dense fog/moderate to dense fog at isolated places very likely over Nagaland, Manipur, Mizoram & Tripura from 16<sup>th</sup> to 18<sup>th</sup> and moderate to dense fog at isolated places very likely over Assam & Meghalaya from 15<sup>th</sup> to 17<sup>th</sup> December, monitor the standing crops for incidence and spread of pest diseases, tomato and onion crops for early/late blight disease. If symptoms are noticed, undertake plant protection measures.
  - **Assam & Meghalaya, Arunachal Pradesh:**
    - In Arunachal Pradesh, harvest mature citrus fruits, maize cobs and rice. Cover newly emerged banana bunches with locally available sack to protect from cold/frost. Carry out weeding and earthing up operations in pineapple.
    - In Meghalaya, continue harvesting of Sali/kharif rice. Continue harvesting French bean, rajmash and cow pea. Carry out harvesting of ginger and turmeric crops when the part of the plant above the ground has fully dried. Carry out harvesting of ripened fruits of khasi Mandarin. Continue sowing of Muastard varieties like Varuna, Krishna, TM 4; Rapeseed- M 27, TS 38, TR 48, TR 67. Transplant 3-5 weeks old seedlings of cabbage, cauliflower and broccoli. Carry out earthing up operation after application of urea.
    - In Barak Valley Zone of Assam, carry out weeding and earthing up operations in rajmah. Plough the land at least 15 days before transplanting the 25-30 days old seedlings of Boro rice. Drain out excess water from Cabbage, cauliflower and Knolkhol fields.
    - In Lower Brahmaputra Valley Zone of Assam, continue harvesting of Sali rice. Provide irrigation to the nursery beds and surrounding furrows in Boro rice field. Transplant 30 days old seedlings in the main field. Carry out earthing up operation in potato. Provide irrigation to wheat crop at 25 days from sowing. Provide irrigation to rape seed.
    - In the Hill Zone of Assam, continue sowing of Boro paddy varieties like Mahsuri, IR-50, Dinanath, Bishnuprasad, Jyotiprasad, Kanaklata and Dinanath in nursery bed during this month. Continue land preparation and sowing of lentil varieties like B-77, L-9, L-12, etc. Carry out thinning and weeding operations in rape seed and mustard crops and provide irrigation.
    - In the North bank Plain Zone, complete sowing of Boro paddy varieties like Mahsuri, IR-50, Dinanath, Bishnuprasad, Jyotiprasad, Kanaklata and Dinanath in nursery bed during this month. Undertake sowing of late sown varieties of rape seed and mustard like TS-46, TS-67, JT 90-1(Jeuti) etc. after harvesting of Sali rice. Continue sowing of rabi pulses like lentil, rajmah, pea, lathyrus and provide irrigation 20-25 days after sowing.
    - In the Upper Brahmaputra Valley Zone, complete sowing of boro paddy in nursery beds. Apply light irrigation to Rabi vegetables. Spray potato crop with Mancozeb @ 2.5gm/lit of water as prophylactic measure against late blight disease. Apply 3 sprays at 10-12 days interval for good result. For saw fly in the rapeseed & mustard crop, spray Chloropyriphos 20 EC @ 5ml/litre of water. To protect the seedlings from cut worm, incorporate Malathion 5% dust @ 20kg/ha in the soil around the plant. To protect the Rabi vegetable seedlings from cut worm, incorporate Malathion 5% dust @ 20kg/ha in the soil around the plant.
    - In the Central Brahmaputra Valley Zone, continue harvesting of mature Sali paddy. Continue nursery bed preparation and sowing of Boro rice varieties like Joymati, Bishnuprasad, Swarnabh, Dinanath, etc. Continue land preparation/sowing of wheat and apply irrigation after 20-25 days from sowing.
    - In Arunachal Pradesh, for leaf eating caterpillars in cole crops, spray Azadirachtin(0.015%) @6ml/litre of water when weather is clear. Spray with neem based pesticides against aphids and painted bugs in cruciferous crops.
    - In the Lower Brahmaputra Valley Zone, apply Chloropyriphos 20EC or Dimethoate 30EC, 0.5 lit per 500-700 lit of water per ha for aphid and saw-fly infestation in rapeseed crop. Spray potato crop with Mancozeb @ 2.5gm/lit of water as prophylactic measure against late blight disease. Apply 3 sprays at 10-12 days interval for good result.
    - In the Barak Valley zone, apply Redomil @ 2ml/lit of water at the first appearance of late blight. Spray Indofil M-45 @ 2.5 ml/litre of water 10-15 days after application of Redomil alternately until full control of late blight.
    - In the Hill zone of Assam, provide alternate application of Ridomil MZ-72 (2g/ lit) and Indofil M-45 2.5g / lit at 15 days interval to prevent the disease of leaf blight in tomato crop. Spray Malathion 50 EC @ 1.5 ml/litre on a non rainy day if infestation of leaf eating caterpillars is observed in cole crops.
  - **Nagaland, Mizoram, Manipur and Tripura:**
    - In Manipur, undertake land preparation for sowing of Rabi maize. Drain out excess water and carry out thinning operation in mustard, rape seed, lentil, field pea and black gram crops. Avoid water logging around coriander crop.
    - In Mizoram, provide staking to coffee and rubber seedlings. Carry out harvesting of mature kharif rice after current spells of rain. Carry out field preparation for cole crops and continue planting of potato, tomato and chilli. Carry out weeding, thinning and earthing up operations and provide irrigation at 3 days interval to rabi maize crop. Provide irrigation and carry out regular harvesting of fruits in khasi mandarin, acid lime, banana, star fruit, peach and plum.
    - In Nagaland, continue sowing lentil and linseed. Keep toria field free of weeding. Carry out thinning, weeding and

- earthing up in Rabi maize. Continue transplanting cabbage and cauliflower.
- In Manipur, spray Borax @ 3g/ lit of water or spray Tracel (micronutrient @ 5 g/ litre of water) in addition to recommended dose of fertilizer if Whip tail is observed in cauliflower. Spray Flubendiamide (Fame) @ 2ml/ 10 lit of water for leaf eating caterpillar in Cabbage, Cauliflower, Tomato and Potato.
- In Tripura, to prevent fungal attack in potato, tomato and cole crops, stop the irrigation for next 72 hours and apply combination of either Carbendazim & Chlorothalonil or Bavistin & Mancozeb or Metalaxyl and Mancozeb @ 2 gm per litre of water along with sticker Fandovit to prevent wastage of fungicide. Apply Dimethoate (Rogor) or Imidacloprid @ 0.8ml per liter of water in banana for aphid attack.
- In Tripura, Complete the sowing of legume vegetables like, toria, sesame, lintel, etc. Stop irrigation to pointed gourd and bitter gourd at flowering stage.
- **Animal Husbandry**
- In Arunachal Pradesh, provide proper bedding materials especially to new-born piglets and lukewarm food & water. Apply Iron injection within 10 days of birth to newly born piglets if they are kept in confined system. Deworm with anti helminthic drugs (particularly Tapeworms) viz. Fento Plus @ 1 tablet per 30 kg body weight. In present weather conditions vaccinate against swine fever (Vaccines available in State Veterinary Depts). Vaccinate cattle against FMD.
- In Meghalaya, provide artificial heating to poultry birds. Provide vitamin B complex @ 7ml/litre in drinking water daily in broiler for healthy growth. Provide coccidiostatic like Amprolium @ 25-65 mg/kg feed once a day as a preventive measure against coccidiosis. Vaccinate the poultry birds with F1/ Lasota vaccine (1 drop) at the age of 4-7 days old and 35 days old through eye and nostril. Vaccinate 6-9 months old calves with Brucella abortus cotton strain-19 @ 5ml subcutaneous on the neck. Undertake regular immunization of cattle & buffaloes against Foot & Mouth disease, Haemorrhagic septicaemia & Black Quarter.
- In the Lower Brahmaputra Valley Zone, to control Avian Cholera of duck, apply Sulfadimethoxine-orometoprim (0.02-0.04%) and Chlortetracycline (0.044%) in given feed or vaccinate with duck cholera vaccine (@ 1ml) in skin.
- In Hill Zone of Assam, immunize cattle against FMD, BQ, Enterotoxaemia and Hemorrhagic Septicemia.
- In Manipur, vaccinate and de-worm cattle, sheep, goat and pigs. Carry out shearing of sheep during this month. Protect animals/ birds from sudden drop in temperature by covering the walls with hessian cloth/ polythene sheet during night time.
- **Fishery**
- In the Lower Brahmaputra Valley and In Barak Valley Zones, pond fishes may be affected by EUS disease. Apply CIFAX @ 1 litter per hectare for 1 meter water depth to prevent the disease.
- In the North Bank Plain Zone, apply Potash @ 4-5 mg/lit of water, Sukrena WS @ 1 lit per bigha of water and Lime in required doses to protect the fish population against various bacterial diseases prevalent in winter season.
- In the Central Brahmaputra Zone, Apply Potash @ 4-5 mg/lit of water, Sukrena WS @ 1 lit per bigha of water and lime in required doses to protect the fish population against various bacterial diseases prevalent in winter season.
- In Tripura, apply an extra dose of Lime @ 200 kg per ha to prevent the outbreak of EUS (ulcer disease).

### WEST INDIA [GOA, MAHARASHTRA, GUJARAT]

- **Realised Rainfall:** Weather remained mainly dry/dry over the region during the week.
- **Advisories:**
  - **Maharashtra:**
    - In North Konkan, complete sowing of *rabi* rice and *Nagli* as early as possible. Use improved, high yielding and certified seeds for sowing of *rabi* rice. If the seedlings have attained an age of 15 days, then apply 1 kg urea or 2 kg ammonium sulphate per 1 R area of Rice/*Nagli* nursery. Continue sowing of short duration crops like *cowpea*, *wal* and *kulthi* on residual moisture in the harvested kharif rice field at *vapsa* condition. Complete the sowing of groundnut, sunflower and mustard as early as possible. Apply light irrigation to groundnut crop three days after sowing at an interval of 10-12 days. Also apply irrigation to sunflower and mustard crop.
    - In South Konkan, undertake land preparation for cultivation of rabi groundnut. Use seed @ 125 to 150 kg for sowing (varities : TG-26, TAG-24, TPG-41, Konkan Gaurav, Konkan Tapora). Weather is suitable for sowing of mustard (varities : 'Pusa bold' and 'Varuna'). Apply urea @ 1 kg and 3 kg SSP per R area before sowing of seeds.
    - In Madhya Maharashtra, complete preparatory tillage practices for planting of Suru sugarcane. Prepare nursery for summer onion.
    - In Vidarbha, continue nursery sowing of *summer* rice. Undertake intercultural operation like hoeing and weeding for 20 DAS for gram crop.
    - In Marathwada, in wheat crop if second dose of nitrogen was not applied then apply Nitrogen @ 50 kg per hectare. Undertake intercultural operation like hoeing and hand weeding. If dose of Nitrogen was not applied to sugarcane crop, it should apply @ 120 kg Nitrogen/ha by using Urea to sugarcane crop sown in the month of October.
    - In Konkan, due to heavy leaf flush on mango and cloudy and highly humid weather condition, there may be huge attack of mango hopper on mango inflorescence. For its control spray 25 % Cypermethrin @ 3 ml or 2.8 %

- Deltamethrin @ 9 ml or 20 % Fenvelarate @ 5 ml per 10 liters of water.
- In Madhya Maharashtra, in *rabi* onion (*Rangada*) there is chances of leaf blight disease, spray Dithane M- 45 (0.3 %). Undertake vaccination in animals to protect from Foot and Mouth Disease, Haemorrhagic septicaemia and Black Quarter.
- In Marathwada, To control attack of aphids on safflower, spray Acephate (75 %) or Dimethoate @ 1.3 ml per liter of water. Apply irrigation by using only sprinkler irrigation system.
- **Gujarat:**
  - In South Saurashtra Zone, carry out picking of cotton during morning hours. Apply irrigation in pigeon pea, wheat, cumin, garlic, onion and coriander at regular interval.
  - In Bhal and Coastal Zone, apply irrigation in the standing crops. Carry out weeding, intercultural operations, earthing up operations in vegetable crops.
  - In North Gujarat Zone and North West Zone of Gujarat, continue picking of matured bolls of cotton. Apply irrigation in potato, mustard, wheat (CRI stage) and lemon orchard. Undertake intercultural operations in vegetable crops (brinjal, chilli, tomato, cabbage, and cauliflower). Continue harvesting of fruit crops like custard apple, pomegranate and aonla.
  - In Middle Gujarat Zone, apply irrigation in wheat (CRI stage) and potato. Undertake nipping in chickpea for higher tillering.
  - In South Gujarat Heavy Rainfall Zone, undertake intercultural operations in pulse crops as per need. Undertake ploughing to remove weeds and for aeration in the sapota, mango orchard field.
  - In North Saurashtra Zone, under present weather conditions, heliothes infestation is observed in chickpea; monitor the crop regularly for heliothes and prodenia infestation. Install “T” shaped bird perches in and around crop field for controlling the insect population. Spray neem seed extract 5 % or neem seed oil 50 ml. If infestation crosses ETL, spray Quinalphos @20 ml/10 litres of water. Also to prevent blight infestation in chickpea spray Mencozeb @ 27 g/10 liters of water at 10 days interval as precautionary measure.
- **Animal Husbandry**
  - In Gujarat, provide adlib warm water to lactating animals. Keep young calves indoors during night time to avoid cold stress. Provide dry fodder to animals twice a day.

### CENTRAL INDIA [M.P., CHHATTISGARH]

- **Realised Rainfall:** Weather remained mainly dry/dry over the region during the week.
- **Advisories:**
  - **Madhya Pradesh:**
    - In Central Narmada Valley Zone, continue sowing of chickpea, wheat and alsli, planting of potato and garlic and harvesting/threshing of matured rice crop.
    - In Bundelkhand Zone, apply irrigation in wheat at CRI stage. Undertake weeding and hoeing in onion and garlic. Undertake earthing up in potato.
    - In Nimar Valley Zone, continue nursery preparation for onion, apply irrigation in wheat.
    - In Malwa Plateau Zone, apply first irrigation in wheat at CRI stage. Continue earthing up in potato. Continue nursery sowing of onion. Continue intercultural operations in vegetables.
    - In Jhabua Hill Zone, apply irrigation in wheat at CRI stage, after first irrigation give 1/3dose of urea as top dressing. Continue transplanting of winter vegetables. Continue picking up of cotton bolls.
    - In Kymore Plateau and Satpura Hill Zone, continue sowing of wheat. Undertake harvesting of matured pea.
    - In Malwa Plateau Zone, for control of gram cut worm, apply Chlorpyriphos dust or Melathion dust @ 20 kg/ha.
  - **Chhattisgarh:**
    - In Chhattisgarh Plain Zone, apply irrigation in wheat at CRI stage. Undertake transplanting of onion and intercultural operations in vegetables. Undertake preparation of seedlings of cucurbits in polythene bags.
    - In Bastar Plateau Zone, continue nursery preparation for *rabi* vegetables (cabbage, cauliflower, brinjal, tomato and chilly). Undertake harvesting of matured pulses.
    - In North Hill Zone, undertake intercultural operations in pulse and oilseed crops. Apply irrigation in wheat at CRI stage. Undertake earthing up in potato.
    - In North Hill Zone, there are chances of infestation of powdery mildew disease in pea, spray Karathen @ 1 ml per litre of water or Sulfex @ 3 gm per litre of water to control the disease.
- **Animal Husbandry**
  - In Madhya Pradesh, provide 3-4 hours light in poultry houses during night and give the food, mixed with vitamins and energy food material.
  - In Chhattisgarh, low temperature condition may adversely affect the milk production and performance of domestic animals; give protein enriched diet to the animals. Keep animal indoor. Provide supplementary wormicide medicine in feed of poultry birds.



## NORTH INDIA [JAMMU & KASHMIR, HIMACHAL PRADESH, UTTARAKHAND, PUNJAB, HARYANA, DELHI, UTTAR PRADESH & RAJASTHAN]

- **Realised Rainfall:** Rain/snow occurred in all districts of Jammu & Kashmir except Kargil and Ladak(Leh), in Chamoli, Dehradun, Garhwal Tehri and Uttar Kashi districts of Uttarakhand, all districts of Himachal Pradesh except Sirmaur, in Gurdaspur, Hoshiarpur, Nawanshahar, Sas Nagar(Mohali), Tarn Taran districts of Punjab and weather remained mainly dry/dry over rest of the region during the week.
- **Advisories:**
  - As dense to very dense fog at a few places very likely over Punjab, Haryana, West Uttar Pradesh, north Rajasthan from 15<sup>th</sup> to 17<sup>th</sup>, dense fog at isolated places over Jammu division of Jammu & Kashmir, lower regions of Himachal Pradesh and Uttarakhand on 15<sup>th</sup>, Moderate to dense fog at isolated places over Jammu division of Jammu & Kashmir, Himachal Pradesh, Uttarakhand and West Uttar Pradesh on 16<sup>th</sup>, Moderate to dense fog at isolated places very likely at isolated places over Jammu & Kashmir, Himachal Pradesh and Uttarakhand on 17<sup>th</sup>, over Punjab, Haryana, north Rajasthan, Uttar Pradesh from 17<sup>th</sup> to 19<sup>th</sup> December, monitor the standing crops for incidence and spread of pest diseases, tomato and onion crops for early/late blight disease. If symptoms are noticed, undertake plant protection measures.
  - As severe cold wave conditions very likely at isolated places over Punjab, Haryana and West Rajasthan on 16<sup>th</sup>, over north Rajasthan from 17<sup>th</sup> to 19<sup>th</sup>, cold wave conditions very likely at isolated places over lower regions of Jammu & Kashmir, Himachal Pradesh and over Punjab, Haryana, West Uttar Pradesh and West Rajasthan on 15<sup>th</sup>, Jammu & Kashmir, Himachal Pradesh, West Uttar Pradesh and East Rajasthan on 16<sup>th</sup>, over Punjab, Haryana and Uttar Pradesh from 17<sup>th</sup> to 19<sup>th</sup> December, apply light and frequent irrigation /sprinkler irrigation in the evening to protect the crops from frost/cold injury. To protect young fruit plants from chilly winds, cover young fruit plants with straw/polythene sheets/gunny bags.
  - **Jammu & Kashmir:**
    - In Sub Tropical Zone, farmers are advised to go for sowing of late sown irrigated wheat crop (varieties: WH-1021, PBW-590, PBW-373, Raj-3077, Raj-3765, DBW-16) and rainfed wheat WH-1080, Raj-3077 with enhanced seed rate 125 kg /ha and recommended dose of fertilizers. Treat the seed with Carboxin/Carbendazim @ 2g/kg or Tebuconazole @ 1.25g/kg of seed to reduce seed borne diseases. Drain out excess water from vegetable fields. Provide thatching prepared from Sarkanda or any other material to young plants to protect them from low temperature. Keep the orchard clean when soil reaches vattar condition. Prune the citrus orchard wherever harvesting is complete. Apply 2% methyl parathion dust @ 250gm/basins or alternatively use alkathane or sticky grease band, 15-20 cm wide, 0.5 m above ground level to check mealy bugs.
    - In Intermediate Zone, as good rainfall is received in many parts during last few days, farmers are advised to undertake late sowing of wheat (var. Raj 3077 and Raj 3765).
  - **Uttarakhand:**
    - In Sub Humid Sub Tropic Zone, as mainly dry weather would prevail, undertake weeding in wheat and intercultural operations in onion and garlic crops.
    - In Hill Zone, complete earthing up in potato, complete intercultural operations in vegetables.
    - In Bhabar and Tarai Zone, continue transplanting cabbage and cauliflower. Complete intercultural operations in vegetables before commencement of rain.
  - **Himachal Pradesh:**
    - In High Hill Temperate Dry Zone, continue sowing of seeds of Chinese cabbage, spinach and coriander in poly house.
    - In Solan Shimla, Bilaspur and Sirmour districts of Mid Hills Sub Humid Zone, continue transplanting of onion. Continue cultivation of mushroom.
  - **Punjab, Haryana and Delhi:**
    - In Punjab, as cold wave /severe cold wave conditions would prevail, cover young fruit plants and nursery plants with thaches/Sarkanda to save from low night temperature.
    - In Delhi, keeping in view of forecasted temperature for next week which will be below the optimum temperature required for the wheat germination. Therefore, farmers who are interested for late sowing of wheat are advised to increase the seed rate. Seed rate: - 125 kg seed per hectare. Recommended cultivars: - P.B.W.373, WR-544, U.P.2338, U.P.2425. Seed should be treated with Bavistin or Thiram @ 2-2.5 g per kilogram of seed. Thinning and weeding is recommended in late sown mustard crop. If low temperature continues for two weeks white rust infection may start in mustard crop. So keep observation on leaves for white rust appearance.
  - **Rajasthan:**
    - In Southeastern Humid Plain Zone, undertake sowing of gram upto 15<sup>th</sup> December and late sowing of wheat upto end of December. Apply first irrigation in mustard at 35-40 days after sowing.
    - In Sub Humid Southern Plain and Aravalli Hill Zone, continue sowing of late sown wheat. Undertake thinning in mustard.
    - In Irrigated North Western Plain Zone, apply irrigation in sugarcane, mustard and gram.

- In Semi arid Eastern Plain Zone, continue sowing of late varieties of wheat.
- In Semiarid Eastern Plain Zone, there are chances of aphid attack on mustard & barley. Dust Malathion 2% @ 25 kg per hectare. If, facility of water exists, then spray Malathion 50 EC @ 1 ml per liter water.
- **Animal Husbandry**
- In Jammu & Kashmir, give special care to young calves as they are more sensitive to pneumonia. Protect the pregnant and milch animals from cold and feed them mineral mixture regularly. To avoid cracking or fissuring of teats in cold dry weather, clean the teats with warm water and apply ghee or butter after every milking. Put some bedding material like puaal etc. to keep animals warm. Provide dry bedding during night. Do not allow animals to leave khurli early in morning directly to open area. In Poultry keep the chicks warm by providing artificial light in the poultry sheds.
- In Punjab, keep the animals inside the sheds and provide dry bedding and use heaters inside cattle sheds to protect them from cold. Increase protein level and minerals in the feed concentrate to keep the animals healthy to cope up with the situation. Keep the chicks warm by providing artificial light in the poultry sheds.
- **Apiculture:**
- In Jammu & Kashmir, farmers are advised to migrate the honey bee colonies from hilly regions to plains to avoid mortality due to decline in temperature. Farmers are advised to inspect honey bee colonies after every fortnight interval to maintain cleanliness and to avoid mortality of honey bees due to brood and disease infestation. In case of non-availability/insufficient flora, give artificial feeding to the honey bee colonies after every 7 – 10 days. Proper winter packaging of honey bee colonies should be done to avoid mortality of honey bees from cold in Intermediate lower and higher zone.

- The Agromet Products in this Bulletin are generated by Agrimet Division, weather forecast issued by NWFC, New Delhi and Agromet Advisories are prepared based on the DAAS Bulletins issued by different Agrometeorological Field Units.