



National Agromet Advisory Service Bulletin

Friday 20th December 2019

(For the period 20th to 24th December 2019)



Issued by

India Meteorological Department

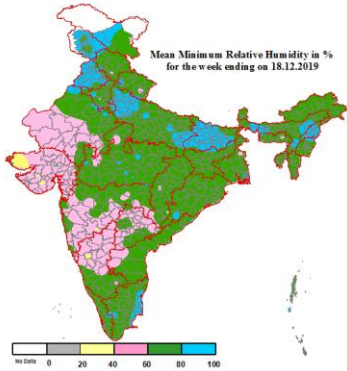
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District AAS Bulletin: <http://www.imdagrimet.gov.in/node/3545>

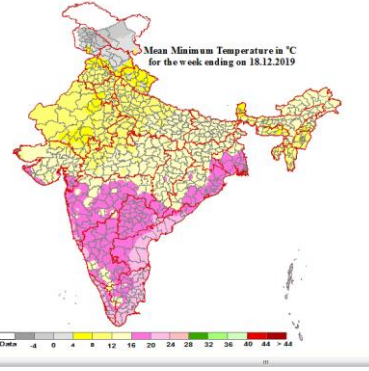
State Composite AAS Bulletin: <http://www.imdagrimet.gov.in/node/3544>

spatial distribution of weather parameters for the week ending on 18.12.2019

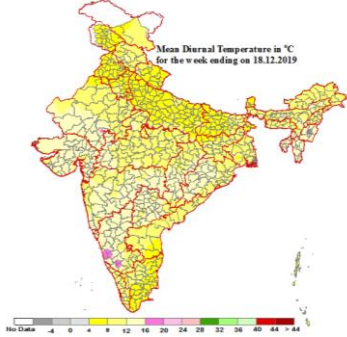
Mean Maximum Temperature (°C) for the week ending on 18.12.2019



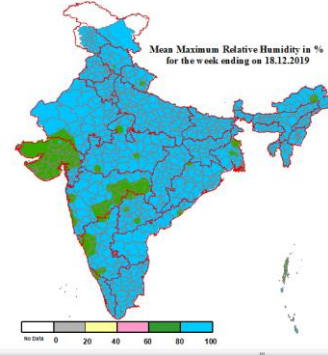
Mean Minimum Temperature (°C) for the week ending on 18.12.2019



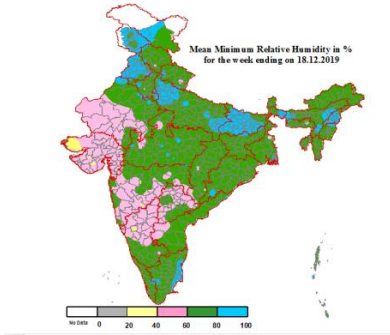
Mean Diurnal Temperature Variation (°C) for the week ending on 18.12.2019



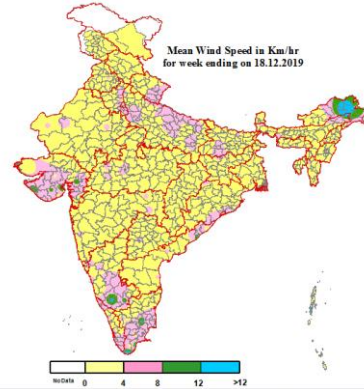
Mean Maximum Relative Humidity (%) for the week ending on 18.12.2019



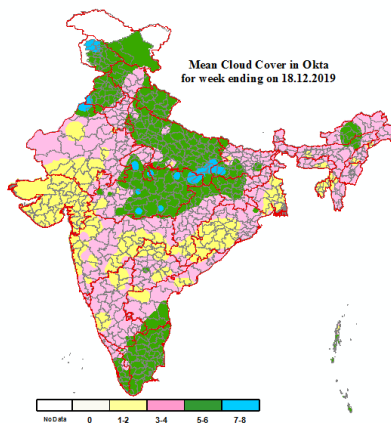
Mean Minimum Relative Humidity (%) for the week ending on 18.12.2019



Mean Wind Speed (km/hr) for the week ending on 18.12.2019

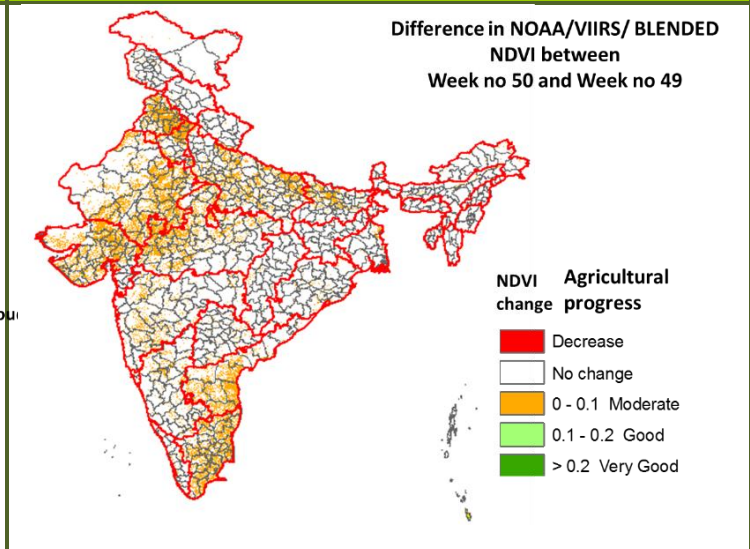
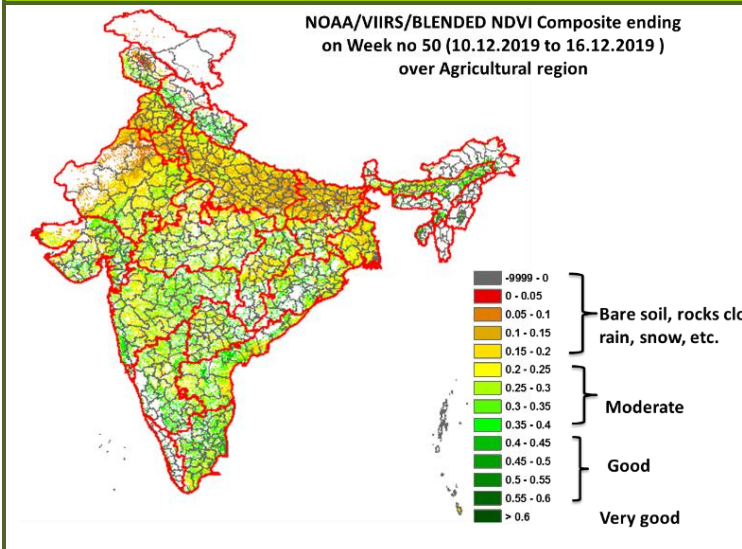


Mean Cloud Cover (okta) for the week ending on 18.12.2019



NOAA/VIIRS/BLENDED NDVI composite for the week number 50 (10.12.2019 to 16.12.2019) over Agricultural regions of India

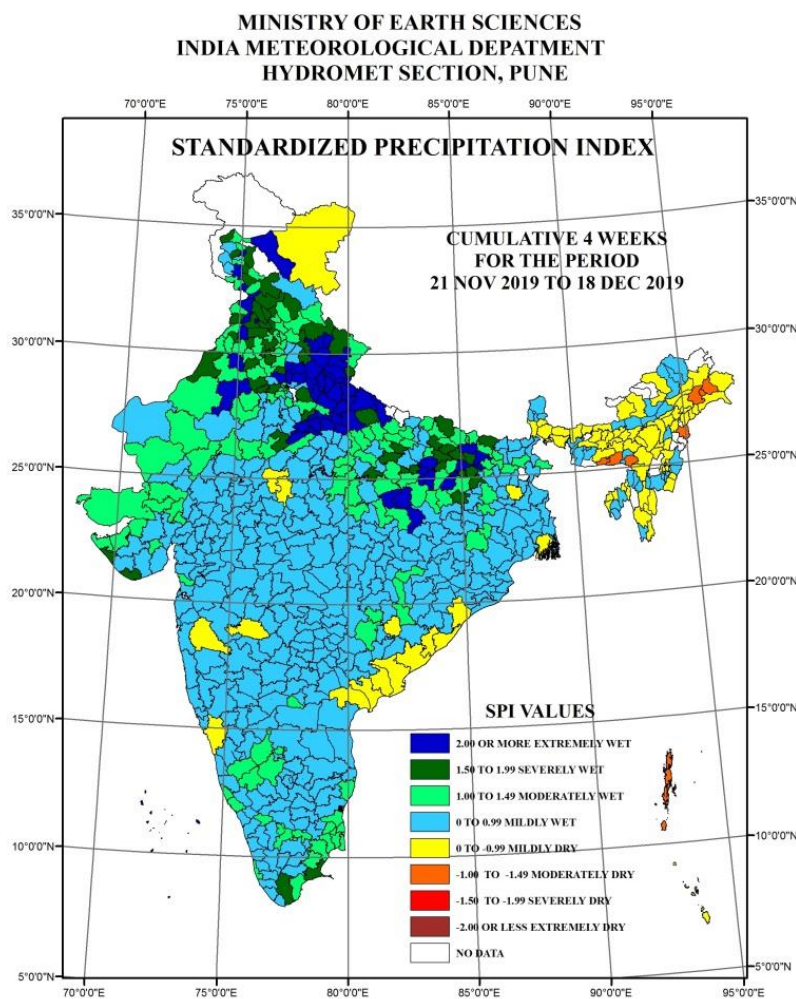
Difference in NOAA/VIIRS/BLENDED NDVI between week number 50 and week number 49



Agriculture vigour was good at many parts of Uttarakhand; few parts of North Eastern states, Chhattisgarh, Odisha, Tamilnadu, Karnataka & Andhra Pradesh and at isolated places in South Konkan, Madhya Pradesh, Sub Himalayan West Bengal, Sikkim, Jharkhand, Kerala, East Vidarbha, Gujarat, Himachal Pardesh & Telangana .

Good difference in agricultural vigour has been observed at isolated places over Andhra Pradesh, Tamil Nadu, West Madhya Pradesh & Kerela and moderate over Uttar Pradesh, Bihar, Punjab, Haryana, Rajasthan, Gujrat & Madhya Maharashtra. It was isolated over rest of the country.

Standardised Precipitation Index Cumulative 4 weeks for the period 21st Nov to 18th Dec 2019



- Extremely/Severely wet conditions exist in Aurangabad, Bhabua, Buxar, West Champaran, Jahanabad, Madhubani, Muzaffarpur, Nalanda, Nawada, Patna, Samastipur, Saran, Siwan, Vaishali, Arwal districts of Bihar; Porbandar, district of Gujarat; Bhiwani, Sirsa, Sonapat, Kaithal, Panipat, Fatehabad, Jhajjar districts of Haryana; Chamba, Kangra, Kullu, Hamirpur, Una districts of Himachal Pradesh; Anantnag, Reasi, Udhampur, Badgam, Kupwara, Pulwama, Kargil, Ramban, Samba districts of Jammu & Kashmir; Sidhi, Singrauli districts of West Madhya Pradesh; Gurdaspur, Hoshiarpur, Jalandhar, Kapurthala, Ludhiana, Patiala, Moga, Ropar, Faridkot, Nawanshahar, Tarn Taran, Barnala districts of Punjab; Churu, Sri Ganganagar, Dholpur, Karauli districts of Rajasthan; Ramanathapuram, Tirunelveli districts of Tamilnadu; Bahraich, Ballia, Chandauli, Deoria, Farrukhabad, Ghazipur, Hardoi, Kannauj, Kheri, Pratapgarh, Sitapur, Sultanpur, Varanasi, Sahuji Maharaj Nagar, Sant Ravidas Nagar, Agra, Baghpat, Bareilly, Bijnor, Badaun, Bulandshahar, Etah, Firozabad, Mahamaya Nagar, Jyotiba Phule Nagar, Mainpuri, Meerut, Moradabad, Muzaffarnagar, Pilibhit, Rampur, Shahjahanpur, Hapur, Sambhal districts of Uttar Pradesh; Chatra district of Jharkhand; Almora, Chamoli, Champawat, Dehradun, Haridwar, Nainital, Garhwal Pauri, Garhwal Tehri, Uttarkashi, Udham Singh Nagar, Rudraprayag, Bageshwar districts of Uttarakhand; Surajpur district of Chhatisgarh; Central Delhi district of Delhi.
- Moderately dry conditions exist in East Kameng, Lohit and Lower Dibang Valley of Arunachal Pradesh, East Khasi Hills district of Meghalaya; Tuensang district of Nagaland; and Andaman & Nicobar Islands.
- Moderately wet to mildly dry conditions were experienced in remaining districts in the country.

Weather Forecast for next 5 days valid upto 0830 hours of 25th December 2019

- ◆ Meteorological sub-division wise detailed 5 days precipitation forecast is given in Table below.
- ◆ Shallow to Moderate fog in isolated pockets very likely over Jharkhand, Gangetic West Bengal, East Madhya Pradesh, Chhattisgarh, Odisha, Madhya Maharashtra and parts of northeast India during next 2- 3 days.
- ◆ No significant change in minimum temperatures over the country during next 2 days.

5 Day Rainfall Forecast (MID-DAY) 20th December 2019

Met-Sub-Division	20-Dec Today	21Dec Sat	22Dec Sun	23Dec Mon	24Dec Tue
1. Andaman & Nicobar Islands	ISOL	ISOL	ISOL	DRY	DRY
2. Arunachal Pradesh	ISOL	ISOL	ISOL	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	ISOL
9. Bihar	DRY	DRY	DRY	DRY	ISOL
10. East Uttar Pradesh	DRY	DRY	DRY	ISOL	ISOL
11. West Uttar Pradesh	DRY	DRY	DRY	ISOL	ISOL
12. Uttarakhand	SCT	ISOL	DRY	DRY	DRY
13. Haryana, Chd & Delhi	ISOL	ISOL	DRY	DRY	DRY
14. Punjab	ISOL	DRY	DRY	DRY	DRY
15. Himachal Pradesh	SCT	ISOL	DRY	DRY	DRY
16. Jammu & Kashmir	FWS	ISOL	DRY	DRY	ISOL
17. West Rajsthan	DRY	ISOL	DRY	DRY	DRY
18. East Rajasthan	DRY	DRY	DRY	ISOL	ISOL
19. West Madhya Pradesh	DRY	DRY	ISOL	SCT	ISOL
20. East Madhya Pradesh	DRY	DRY	DRY	ISOL	SCT
21. Gujarat Region	DRY	DRY	DRY	DRY	DRY
22. Saurashtra & Kutch	DRY	DRY	DRY	DRY	DRY
23. Konkan & Goa	DRY	DRY	ISOL	ISOL	DRY
24. Madhya Maharashtra	DRY	DRY	ISOL	ISOL	ISOL
25. Marathawada	DRY	DRY	DRY	ISOL	DRY
26. Vidharbha	DRY	DRY	DRY	ISOL	DRY
27. Chhattisgarh	DRY	DRY	DRY	ISOL	ISOL
28. Coastal A. P. & Yanam	DRY	DRY	DRY	DRY	DRY
29. Telangana	DRY	DRY	DRY	DRY	DRY
30. Rayalaseema	DRY	DRY	DRY	DRY	DRY
31. T.N.,Puducherry & Karaikal	SCT	ISOL	ISOL	ISOL	ISOL
32. Coastal Karnataka	DRY	DRY	DRY	ISOL	ISOL
33. North Interior Karnataka	DRY	DRY	DRY	DRY	ISOL
34. South Interior Karnataka	DRY	DRY	DRY	ISOL	ISOL
35. Kerala & Mahe	ISOL	ISOL	ISOL	ISOL	SCT
36. Lakshadweep	FWS	SCT	FWS	FWS	SCT

% 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

20 December (Day 1):

- ◆ **Severe cold day conditions** in most pockets very likely over Haryana, Chandigarh & Delhi and Uttar Pradesh and in a few pockets over Bihar; **cold day conditions** in few pockets with **severe cold day** in isolated pockets Himachal Pradesh, Uttarakhand and Punjab and **Cold day conditions** in isolated pockets over Jammu & Kashmir, Rajasthan, Madhya Pradesh, West Bengal & Sikkim and Jharkhand.
- ◆ **Cold wave conditions** very likely in isolated pockets over East Uttar Pradesh, Bihar, Gangetic West Bengal, Jharkhand and Odisha.
- ◆ **Dense fog** in isolated pockets very likely over Uttarakhand, Punjab, Haryana, Chandigarh & Delhi, Uttar Pradesh, Rajasthan, south Assam & Meghalaya, Tripura, north Madhya Pradesh, Jharkhand, Bihar and Sub-Himalayan West Bengal & Sikkim in the morning hours.
- ◆ **Heavy rainfall** very likely at isolated places over south Tamilnadu, Kerala & Mahe and Lakshadweep.
- ◆ **Thunderstorm accompanied with lightning** very likely at isolated places over Tamilnadu, Puducherry & Karaikal, Lakshadweep and Kerala & Mahe.
- ◆ **Squally weather** very likely to prevail over Comorin area and adjoining south Kerala coast.

21 December (Day 2):

- ◆ **Cold day conditions** in many pockets with **severe cold day** in some pockets very likely over East Uttar Pradesh; **Cold day conditions** with **severe cold day** in isolated pockets over Punjab, Haryana, Chandigarh & Delhi and West Uttar Pradesh and **Cold day conditions** in some pockets over Himachal Pradesh and Bihar and in isolated pockets over Jammu & Kashmir, Uttarakhand, Madhya Pradesh and Sub-Himalayan West Bengal & Sikkim.
- ◆ **Cold wave conditions** very likely in isolated pockets over Bihar, Gangetic West Bengal, Jharkhand and Odisha.
- ◆ **Dense fog** in isolated pockets very likely over Punjab, Haryana, Chandigarh & Delhi, Uttar Pradesh, Rajasthan, south Assam & Meghalaya, Tripura, north Madhya Pradesh, Jharkhand, Bihar and Sub-Himalayan West Bengal & Sikkim in the morning hours.
- ◆ **Squally weather** very likely to prevail over Comorin area and adjoining south Kerala coast.

22 December (Day 3):

- ◆ **Cold day conditions** very likely in isolated pockets over Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Chandigarh & Delhi and Uttar Pradesh.
- ◆ **Dense fog** in isolated pockets very likely over Punjab, Haryana, Chandigarh & Delhi, Uttar Pradesh, Rajasthan, south Assam & Meghalaya and Tripura in the morning hours.

23 December (Day 4):

- ◆ **Cold day conditions** likely in isolated pockets over Punjab, Haryana, Chandigarh & Delhi and Uttar Pradesh.
- ◆ **Dense fog** in some pockets likely over Haryana, Chandigarh & Delhi and West Uttar Pradesh and in isolated pockets over Punjab and East Uttar Pradesh in the morning hours.

24 December (Day 5):

- ◆ **Cold day conditions** likely in isolated pockets over Punjab, Haryana, Chandigarh & Delhi and Uttar Pradesh.
- ◆ **Dense fog** in some pockets likely over Haryana, Chandigarh & Delhi and West Uttar Pradesh and in isolated pockets over Punjab and East Uttar Pradesh in the morning hours.

Weather Outlook for subsequent 2 days from 25th December to 27th December, 2019

- ◆ Isolated to scattered rainfall is also likely over parts of Bihar, Jharkhand, Chhattisgarh and extreme southern parts of peninsular India.
- ◆ Weather likely to be dry over remaining parts of the country.

Salient advisories

- As **thunderstorm accompanied with lightning** very likely at isolated places over **Tamilnadu, Puducherry & Karaikal, Lakshadweep and Kerala & Mahe** on 20th, provide mechanical support to young fruit plants, banana and carry out staking of vegetables as well as propping up in sugarcane to prevent crops from lodging. Keep harvested produce at safer places.
- As **rain/thundershowers** likely at many places over **Jammu & Kashmir** on 20th, over **Lakshadweep** on 20th, 22nd and 23rd along with **heavy rainfall** very likely at isolated places over **south Tamilnadu, Kerala & Mahe and Lakshadweep** on 20th, avoid irrigation, intercultural operation, application of plant protection measures and fertilizers to the standing crops. Provide adequate drainage in standing crop fields to avoid water stagnation. Keep harvested produce at safer places. Keep the cattle under shed during heavy rainfall period.
- As **squally weather** very likely to prevail over **Comorin area** and adjoining **south Kerala coast** on 20th and 21st, provide mechanical support to young fruit plants, banana and staking of vegetables to prevent the crops from lodging due to strong winds. Undertake propping up in sugarcane.
- As **Dense fog** in isolated pockets/ places very likely over **Uttarakhand** on 20th, over **Punjab, Haryana, Chandigarh & Delhi, Uttar Pradesh** from 20th to 24th, over **Rajasthan, south Assam & Meghalaya, Tripura** on 20th, 21st and 22nd, over **north Madhya Pradesh, Jharkhand, Bihar and Sub-Himalayan West Bengal & Sikkim** in the morning hours on 20th and 21st; in some pockets over **Haryana, Chandigarh & Delhi and West Uttar Pradesh** on 23rd and 24th, **shallow to moderate fog** in isolated pockets very likely over **Jharkhand, Gangetic West Bengal, East Madhya Pradesh, Chhattisgarh, Odisha, Madhya Maharashtra and parts of northeast India** during next 2- 3 days, monitor the standing crops for incidence and spread of pest & diseases and monitor tomato and potato crops for blight disease. If symptoms are noticed, undertake plant protection measures.
- As **Cold wave conditions** very likely in isolated pockets over **East Uttar Pradesh** on 20th, over **Bihar, Gangetic West Bengal, Jharkhand and Odisha** on 20th and 21st, with **Severe cold day conditions** in most pockets very likely over **Haryana, Chandigarh & Delhi and Uttar Pradesh** and in a few pockets over **Bihar**; **cold day conditions** in few pockets with **severe cold day** in isolated pockets **Himachal Pradesh, Uttarakhand and Punjab** and **Cold day conditions** in isolated pockets over **Jammu & Kashmir, Rajasthan, Madhya Pradesh, West Bengal & Sikkim and Jharkhand** on 20th; in many pockets with **severe cold day** in some pockets very likely over **East Uttar Pradesh**; with **severe cold day** in isolated pockets over **Punjab, Haryana, Chandigarh & Delhi and West Uttar Pradesh** and **Cold day conditions** in some pockets over **Himachal Pradesh and Bihar** and in isolated pockets over **Jammu & Kashmir, Uttarakhand, Madhya Pradesh and Sub-Himalayan West Bengal & Sikkim** on 21st; very likely in isolated pockets over **Jammu & Kashmir, Himachal Pradesh**, on 22nd and over **Punjab, Haryana, Chandigarh & Delhi and Uttar Pradesh** on 22nd, 23rd and 24th 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. Keep the animals inside the sheds and provide dry bedding and use heaters inside cattle sheds to protect them from cold.
- Undertake sowing/ transplanting of following rabi crops:
 - In **Telangana**, continue nursery sowing of short duration *rabi* rice and sowing of groundnut crop.
 - In **Karnataka**, complete sowing of green gram, black gram, sesame and groundnut crops.
 - In **Assam**, complete nursery sowing of Boro rice and sowing of wheat, maize, rabi pulses and oilseeds crops.
 - In **Odisha**, complete sowing of mustard, groundnut, sesame, sunflower, pea, chickpea pulses and planting of potato.
 - In **Bihar and Jharkhand**, continue sowing of late maturing varieties of wheat.
 - In **West Bengal & Sikkim**, complete sowing of mustard, wheat and lentil and planting of potato.
 - In **Himachal Pradesh**, undertake transplanting of onion and sowing of pea.
 - In **Madhya Pradesh**, complete sowing of wheat, gram, pea, lentil crops and transplanting of tomato, brinjal, chilli, cauliflower, cabbage, spinach, fenugreek, garlic, radish, pea, carrot etc.
 - In **Chhattisgarh**, continue transplanting of onion and planting of potato.
 - In **Uttar Pradesh, Punjab, Haryana and Rajasthan**, complete sowing of wheat.

Detailed Agromet Advisories

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

Realised Rainfall : Significant rainfall occurred in Alappuzha district of Kerala; Nellore district of Andhra Pradesh; Karaikal, Cuddalore, Karaikal, Nagapattinam, Puducherry, Thanjavur, Tirunelveli and Tiruvaur districts in Tamilnadu and Chittor and Nellore districts of Andhra Pradesh. Weather remained mainly dry in rest of the region.

Advisories:

- As **thunderstorm** accompanied with lightning very likely at isolated places over Tamilnadu, Puducherry & Karaikal, Lakshadweep and Kerala & Mahe on 20th, provide mechanical support to young fruit plants, banana and carry out staking of vegetables as well as propping up in sugarcane to prevent crops from lodging. Keep harvested produce at safer places.
- As **heavy rainfall** very likely at isolated places over south Tamilnadu, Kerala & Mahe, and Lakshadweep on 20th, avoid irrigation, intercultural operation, application of plant protection measures and fertilizers to the standing crops. Provide adequate drainage in standing crop fields to avoid water stagnation. Keep harvested produce at safer places. Keep the cattle under shed during heavy rainfall period.
- As **squally weather** very likely to prevail over Comorin area and adjoining south Kerala coast on 20th and 21st, provide mechanical support to young fruit plants, banana and staking of vegetables to prevent the crops from lodging due to strong winds. Undertake propping up in sugarcane.

Kerala

- In High Altitude Zone, undertake harvesting ginger.
- In Central Zone, there is a chance of leaf folder attack in *mundakan* Paddy. Use trichogramma cards (2CC per one acre). Cut the cards in to small pieces and fix in different regions of the field. If the attack is severe, spray Quinalphos @ 2ml per one liter of water.
- In Southern Zone, apply neem cake 1 kg/plant at the time of planting to prevent Rhizome weevil in Banana.

Andhra Pradesh

- In North Coastal Zone, undertake harvesting of rice and sugarcane. Undertake sowing of short duration varieties for rabi paddy nurseries. Soak the seed with Carbendazim @ 1 g/l for 12 hours before taken up sowing. Continue sowing of ragi and maize.
- In Southern Zone, Farmers who are taking up late groundnut sowings are advised to do seed treatment with imidachloprid 600 F.S @ 2 ml. + 4 ml. water per kg of seed followed by tebuconazole @ 1 g./kg seed. Use 60-70 kg per acre and maintain the spacing of 22.5 cm between the rows and 10 cm between the plants, so as to maintain plant population of 44 plants/sq.mt.
- In Scarce Rainfall Zone of Rayalaseema, complete sowing of groundnut under irrigated condition. Present weather conditions are favourable for leaf minor and thrips incidence in early sown groundnut. For control of leaf minor to spray chloripyriophos 2.5 ml/l or quinalphos 2 ml/l of water.
- In Krishna Godavari Zone, undertake harvesting of rice when 80-90% of grains converted into yellowish colour in each spikelet.

Telangana

- Undertake sowing of Rabi Groundnut under irrigated situation. Continue nursery sowing of rabi rice nursery by selecting short duration varieties of rice. Before sowing for dry nursery, treat the seed with Carbendazim @ 3 g. per kg of seed and for wet nursery, soak the seeds in Carbendazim solution @ 1 g. per litre of water for 24 hours, after that sprouted seeds are broadcasted into nursery plot.
- Prevailing weather conditions are congenial for maruca and helicoverpa in redgram. Spray chlorpyriphos @2.5 ml or novaluron @ 0.75 ml along with Dichlorvos @ 2ml per liter of water..

- Prevailing weather conditions are congenial for incidence of pinkboll worm in cotton. Monitor the pest & control by placing e pheromone traps 4 per acre for monitoring. If moths are found in trap, spray thiodicarb @ 1.5 gr per lit of water.

Tamil Nadu

- In Cauvery Delta Zone, Bacterial Leaf Blight, Bacterial Leaf Streak and Rice gallmidge are being noticed in Thaladi paddy due to prevailing weather conditions. To control Bacterial Leaf Blight, Bacterial Leaf Streak, spray Streptomycin + Tetracycline 120 G + Copper Oxy Chloride 500 g mixture/acre or Copper Hydroxide at 500 g/ac in 200 litre of water. To manage Rice gall midge, spray Cholorpyriphos 500 ml/acre or fibronil 5% Sc @ 400 ml/ acre.
- In North Eastern Zone, provide staking to newly planted horticultural plants and mechanical support to banana crop to avoid lodging.
- In Western Zone, in irrigated turmeric, considering the high relative humidity, low minimum temperature and high wind speed, leaf spot disease may occur. Spray Carbendazim (1g/1litre of water) or 2g of Mancozeb per litre of water.
- In South Zone, due to the prevailing weather condition Bacterial leaf spot disease spreads in Chilli. Spray 175 gm Agrimycin with 500 litre of water can be controlled.
- In Karaikal & Pondicherry, in rice, to manage gall midge, apply Thiamethoxam 25 WG @ 100g/Ha Or Fipronil 5 SC @ 1000g/Ha Or Fipronil 0.3 CG @ 16 Kg/Ha; to manage leaf folder, apply Azadirachtin 0.03 % (300 Ppm) @ 2000 ml/Ha Or Cartaphydrochloride 50% SP @ 1000 G/Ha Or Flubendiamide 20 WG @ 125 G/Ha; to control blast in rice, spray Carbendazim 50 WP or Tricyclozole 75 WP or Metominostrobin 20 SC or Azoxystrobin 25 SC @ one gram or one ml in one litre of water.
- In North Western Zone, apply enriched groundnut micronutrient mixture @ 5 kg / acre as basal dose to improve the yield of groundnut under micro nutrient deficient soil of rabi season groundnut.

Karnataka:

- In Coastal Karnataka, Continue sowing of green gram, black gram, groundnut and sesame crops. Continue picking mature cotton bolls and harvesting of areca nut. Incidence of Red spider mite pest is more severe in less than four year old arecanut gardens; to control, spray Dicofol @ 2.5 ml or 4 gm water soluble sulphur / litre of water at 15 days of interval.
- In North Interior Karnataka, apply protective irrigation to chickpea, safflower, wheat and sugarcane crops. Continue picking of cotton bolls. Carry out intercultural operations in sorghum and chickpea crops. Incidence of leaf eating caterpillars has been noticed in Niger; spray Dimethoate @ 1.7ml / litre of water.
- In South Interior Karnataka, complete the harvesting of matured maize, rice, ragi, groundnut, sugarcane, areca nut and onion crops. Continue sowing of Black gram, Green gram, Horse gram, chickpea and garlic. Undertake staking in banana. There is a possibility of occurrence of leaf spot in banana; spray Carbendazim @ 1gm/litre of water.

Animal Husbandry:

- In Karnataka, maintain optimum room temperature in sericulture, dairy and poultry units by providing electric bulb.
- In Tamilnadu, incidence of Foot and Mouth disease is noticed in the livestock due to prevailing weather. To control soak cumin 10 g, fenugreek 10 g and black pepper 10 g in water for one hour and grind add turmeric powder 10 g and galic 2 cloves, add jaggaery 100 g, make a slimy paste, add coconut gratings and make into small balls and give to the animal.
- In Western Zone of Tamil Nadu, carry out deworming in sheep, goat, cattle and milch animals during monsoon season.
- In Karaikal and Puducherry, as a preventive measure for Babesiasis disease in cattle, apply Butox @ 2 ml/l of water on cattle and also spray it on the nearby areas of the cattle shed to control ectoparasites.

Realised Rainfall: Rainfall occurred in Upper Siang district of Arunachal Pradesh. Mainly dry weather prevailed over rest of the region during the week.

Advisories:

- **Dense fog** in isolated pockets very likely over south Assam & Meghalaya and Tripura on 20th, 21st and 22nd December in the morning hours, monitor the standing crops for incidence and spread of pest & diseases and monitor tomato and potato crops for early blight disease. If symptoms are noticed, undertake plant protection measures.

Arunachal Pradesh

- In Arunachal Pradesh, continue harvesting of rice. In trunk borer attacked orange trees, cleaning of entry hole and treatment with Dichlorvos dipped cotton swabs is advised and also use of light trap to attract adults.

Assam & Meghalaya

- In Assam, continue nursery bed preparation/ nursery sowing of *Boro* rice and harvesting of matured *Sali* rice.
- In Central Brahmaputra Valley, continue sowing of wheat, maize, pulses and oilseeds crops. Take up transplanting of tomato.
- In Upper Brahmaputra Valley Zone, undertake prophylactic measure against late blight disease of potato by spraying Mancozeb @ 2.5 gm/litre of water at stolon formation stage. Spray Chlorpyrifos 20 EC @ 5 ml/litre of water against saw fly infestation in rapeseed and mustard crops at vegetative stage.
- In Barak Valley Zone, complete the sowing of rapeseed/mustard and planting of potato. Spray Malathion 50 EC @ 1.5ml/litre to protect the cole crops from leaf eating caterpillars.
- In North Bank Plain Zone, continue sowing of *rabi* pulses like lentil, rajmah, pea and lathyrus, winter vegetables like cabbage, cauliflower, knolkhol, brinjal, radish and carrot and planting of potato.
- In Hill Zone of Assam, go for bagging of the banana bunches with muslin cloth or polyethylene before fruit set in order to protect the fruits from the attack of banana fruit and leaf scarring beetle.
- In Meghalaya, carry out harvesting of *Sali*/kharif rice (lowland) and make the field ready for *Rabi* crops. Go for regular harvesting of ginger, turmeric and Khasi Mandarin fruits.

Manipur, Mizoram, Tripura and Nagaland

- In Nagaland, spray NSKE 5% or Neem oil 3% twice at 10 days interval from initial disease appearance when the infection of powdery mildew is severe in green gram at flowering stage. Apply mulching in rapeseed at inflorescence stage. Undertake harvesting of sesame crop at maturity stage.
- In Manipur, undertake sowing of *rabi* maize. Intercrop *rabi* maize with French bean, mustard/rapeseed, coriander, spinach, radish, carrot, lentil. Sprays of neem oil may be given as prophylactic measures against insect pest infestation. In fruit crops and perennial vegetables, apply organic mulches after earthing up and weeding to conserve residual soil moisture as well as to maintain the soil temperature. Light irrigation during morning hours is advised for the *rabi* crops (especially in vegetative stages) to avoid effects of frost/ fog on crops. Also smoking is advised in and around the crop field during morning and evening hours.
- In Mizoram, in maize field, surface must be covered with legume and vegetable like pumpkin and cucumber for conserving soil moisture. Provide irrigation at three days interval. Use straw mulch where irrigation is not possible.
- In Tripura, undertake sowing of *Rabi* crops after harvesting of rice. Cultivate potato, gram, lentil, pea, etc. under assured irrigation facilities. Treat seeds of pulse crops with Rhizobium culture before sowing.

Animal Husbandry

- In North eastern states, to protect poultry from cold, put gunny bags or plastic sheath curtains on the side walls of shed and increase bedding material by six inches. Care should be taken not to restrict ventilation.

Provide adequate feed during cold season. Provide supplement in feed with minerals to avoid stress in cattle and pigs.

Fishery

- In Upper Brahmaputra Valley, during winter season fishes are infested by various bacterial diseases. To control these diseases, apply Potash @ 4-5 mg per litre of water in the pond after consultation with Fishery Extension Officer.

EAST INDIA [JHARKHAND, BIHAR, ODISHA, WEST BENGAL & SIKKIM, ANDAMAN & NICOBAR ISLANDS]

Realised Rainfall: Significant rainfall occurred in Arwal, Aurangabad, Bhabua, Buxar, Jahanabad, Muzaffarpur, Nanda, Patna, Samastipur, Siwan, Vaishali, West Champaran districts of Bihar; Chatra district of Jharkhand and North Sikkim district of Sikkim. Weather remained dry/mainly dry over rest of the region.

Advisories:

- **Severe cold day conditions** in a few pockets over Bihar and **Cold day conditions** in isolated pockets over West Bengal & Sikkim and Jharkhand on 20th December. **Cold day conditions** in some pockets over Bihar and in isolated pockets over Sub-Himalayan West Bengal & Sikkim on 21st December. **Cold wave conditions** very likely in isolated pockets over Bihar, Gangetic West Bengal, Jharkhand and Odisha, 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. Keep the animals inside the sheds and provide dry bedding and use heaters inside cattle sheds to protect them from cold.
- **Dense fog** in isolated pockets very likely over Jharkhand, Bihar and Sub-Himalayan West Bengal & Sikkim in the morning hours on 20th and 21st December, monitor the standing crops for incidence and spread of pest & diseases and monitor tomato and potato crops for early blight disease. If symptoms are noticed, undertake plant protection measures.

Odisha

- Complete sowing of groundnut, sesame, sunflower, pea, chickpea and sweet corn, transplanting of brinjal, chilli, capsicum, tomato, cabbage, cauliflower seedlings, planting of carrot, radish, garlic, legumes, sowing of greens like spinach, amaranths, coriander etc. and planting of potato crop. Complete the sowing of rabi pulses like green gram, lentil and black gram. Continue nursery sowing of Rabi rice and onion. Continue picking of matured cotton bolls and harvesting of rice. Apply irrigation to early sown wheat crop at crown root initiation (CRI) stage.
- Monitor the attack of pod borer on developing pods of arhar; if damage symptoms appear spray Profenofos 50% EC @400 ml/acre mixing with 200 litres of water.

Bihar

- Continue sowing of Bengal gram, chick pea and late maturing varieties of wheat. Apply irrigation to timely sown wheat crop at CRI stage, maize and mustard crop. Complete transplanting of 50-55 days old onion seedlings.
- Spray Malathion 50EC @ 2 ml or Dimethoate 30 EC @ 1ml per liter of water for infestation of insects/pests in cabbage and cauliflower crops.

Jharkhand

- Continue sowing of late maturing varieties of wheat. Apply irrigation to potato, vegetable and timely sown wheat crops. Go for nipping in chick pea crop at 30 DAS. Continue sowing of hybrid varieties of leafy vegetables like sarso, bathua, spinach, methi, coriander etc. Complete transplanting of cabbage, cauliflower and tomato.
- Present weather condition is conducive for the attack of Blight disease in potato crop; smoking around the field is the preventive measures against the attack of disease pathogens. However, to control disease spray Saaf @2 gm per litre of water or Redomyl @1.5 gm per litre of water during clear weather.

West Bengal

- In Sub-Himalayan West Bengal, complete sowing of lentil, mustard, wheat and planting of potato. Complete the harvesting of rice, large cardamom and Mandarin orange. Undertake intercultural operation in pea and cole crops.
- In Gangetic West Bengal, complete planting of potato, sowing of mustard and lentil. Complete the harvesting of Aman rice.

Andaman & Nicobar Islands

- Continue field preparation for sowing of pulses as the weather is conducive. Apply vermin-compost @ 8 tonnes/ha as basal dose in transplanted brinjal and apply irrigation depending on moisture.
- To reduce the borer pest in tomato, place pheromone traps and light traps @ 1/100 per sq. meter. Set up Rhinolure pheromone trap @ 1-2 /ha to trap and kill the beetles in coconut garden.

Animal Husbandry

- Make arrangements to protect livestock from cold winds. Make use of bulbs to maintain proper temperature in the poultry house. During winter attack of F.M.D. (Chapka disease) is common in milch animals; wash the tongue and mouth with water containing baking soda and apply glycerine on the tongue of diseased animals; wash wounds of the feet with boiled neem water.

Fishery

- In Odisha, feed the fishes with oil cake bran mixture @ 2-3% of their biomass daily.

WEST INDIA [GOA, MAHARASHTRA, GUJARAT]

Realised Rainfall: Weather remained mainly dry/dry over the region.

Advisories:

Maharashtra

- In Konkan, continue nursery sowing of summer rice. Continue land preparation for sowing of groundnut. Apply irrigation to early sown groundnut. To control hopper in inflorescence, leaf and fruits of mango, spray Thiophenate methyl and Carbendanzim 1% @ 1 g per liter water. To control thrips in onion, spray Quinalphos 25 ml per 10 liters of water.
- In Madhya Maharashtra, complete picking of cotton. Keep harvested produce in safer place. Undertake intercultural operation like weeding and apply irrigation to wheat (21 DAS). To control aphids in sorghum, spray Dimethoate 30 EC @ 10 ml in 10 liters water. To control pod borer in gram, spray 18.5 % Chlorantraniliprole @ 100 ml/ ha in 500 liter of water.
- In Marathawada, apply irrigation and Nitrogen @ 50 kg per ha to wheat (30 DAS). Apply irrigation to vegetables and orchards. To control pod borer in gram, spray 5 % NSKE or Quinalphos 25% EC @ 20 ml per 10 liter of water.
- In Vidharbha, complete picking of cotton. For very late sowing of irrigated wheat use varieties - AKAW 4627 and PDKV Sardar (AKAW 4210-6). Undertake intercultural operations like weeding and apply irrigation in early sown wheat, safflower and gram.

Gujarat

- In Saurashtra & Kutch, apply irrigation to wheat crop at CRI stage and to coriander crop at 15-20 days interval. Continue picking of matured bolls of cotton in time. Under present weather condition, thrips and aphid infestation observed in cumin; for control, spray neem seed extract 5% and Thiomethoxam @ 5 gm/ 10 liters of water.
- In North Gujarat, continue harvesting of matured fruits of custard apple, pomegranate, aonla and picking of matured bolls of cotton. Apply irrigation to wheat (at CRI stage), mustard, potato and castor crops. Apply light irrigation to vegetable crop during evening hours. To prevent blight disease infestation in cumin crop, spray Mencozeb @ 27 gm / 10 liters of water at 10 days interval as a precautionary measure.
- In Middle Gujarat, apply irrigation to wheat crop at crown root initiation (CRI) stage and potato crop. Apply irrigation to tobacco, chilli and cucurbits as per requirement. Carry out picking of mature cotton bolls in time.

- In South Gujarat, carry out weeding in pulses crops.

Animal Husbandry

- In Gujarat, provide luke warm water to lactating animals. Keep young calves indoors during night time to avoid cold stress.

CENTRAL INDIA [M.P., CHHATTISGARH]

Realised Rainfall: Significant rainfall occurred in Chhatarpur, Chindwara, Dindori, Katni, Panna, Shahdol, Sidhi, Singrauli and Umaria districts of East Madhya Pradesh; Bhopal district of West Madhya Pradesh, Surajpur district of Chhattisgarh. Mainly dry weather prevailed over rest of the region during the week.

Advisories:

- **Cold day conditions** in isolated pockets over Madhya Pradesh on 20th and 21st 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. Keep the animals inside the sheds and provide dry bedding and use heaters inside cattle sheds to protect them from cold.
- **Dense fog** in isolated pockets very likely over north Madhya Pradesh on 20th and 21st December, monitor the standing crops for incidence and spread of pest & diseases and monitor tomato and potato crops for early blight disease. If symptoms are noticed, undertake plant protection measures.

Madhya Pradesh

- In Vindhya Plateau Zone, incidence of cut worm on wheat, gram and lentil is observed in some pockets; spray Quinalphos 20 EC or Profenophos 50 EC @1 liter/ha or Emabectin Benzoate @225 gm /ha or Imidachloprid 17.8 SL 200 ml /ha around infested plants on the soil using cut nozzle. Undertake planting of Potato. Undertake nursery sowing of tomato, brinjal and chilli and sowing of cucurbits.
- In Central Narmada Valley Zone, irrigate wheat crop which is in CRI stage (21-25 days after sowing). After 3-4 days of irrigation broadcast of second dose of nitrogen.. Undertake sowing of late maturing wheat
- In Bundelkhand, continue raising onion nursery. Monitor the timely-sown mustard, pea, chickpea and lentil crops for pest and disease infestation. There is possibility of early blight in potato,monitor the crop and if noticed spray Metalaxyl + Mencozeb in 2:1 ratio / liter of water.
- In Jhabua Hill Zone, complete sowing of late maturing wheat. Seed rate should be increase 25% of late sown wheat. Prepare nursery for winter vegetables like tomato, brinjal, chilli, cauliflower, cabbage, spinach, fenugreek, garlic, radish, pea, carrot etc.

Chhattisgarh

- In Chhattisgarh Plain Zone, undertake transplanting of onion. Prepare early crop seedling of Cucurbitaceous vegetable in the bags. In case of attack of powdery mildew disease in field pea, spray Copper fungicide.
- In Northern Hill Zone, apply irrigation to wheat Undertake transplanting of onion. Continue nursery raising of onion seedlings. Continue transplanting of winter vegetables like cauliflower, cabbage, chilli, tomato, brinjal, etc. and direct sowing the seeds of radish, turnip, spinach, carrot, etc. Undertake planting of Potato. Due to prevailing cloudy weather incidence of aphids in mustard, raddish and beans is likely to increase, monitor the crop and if the infestation is above ETL spray Carbaryl@ 2 kg/ha.
- In Bastar Plateau Zone,. due to prevailing cloudy weather there is chance of aphid attack in oilseed, pulses and vegetables. Monitor the crops and spray neem based pesticides when initial outbreak is seen

Animal Husbandry

- Provide concentrated feed to milch animals mixed with dry & green fodder. Cattle should be kept in dry, airy and clean place. Vaccinate the cow and buffaloes for FMD disease and vaccinate goats with ETV vaccine.

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

Realised Rainfall : Significant rainfall occurred in all the districts of Himachal Pradesh; in many districts of Jammu & Kashmir except Badgam, Bandipore,, Poonch, Pulwama, Shopian & Srinagar and in all the districts of Uttarakhand; Amritsar, Barnala, Gurdaspur, Hoshiarpur, Jalandhar, Kapurthala, Ludhiana, Nawashahar, Ropar, Sasnagar, Tarn Taran districts of Punjab; Chadigarh, Central Delhi, New Delhi, North Delhi, North East Delhi, South Delhi, South West Delhi districts of New Delhi; Bahraich, Basti, Chandauli, Chirakoot, Deoria, Farrukhabad, Gazipur, Hardoi, Kannauj, Kheri, Pratagarh, sant Ravidas nagar, Sitapur, Sonbhadra, Sultanpur, Varanasi districts of Uttar Pradesh and Badaun, Baghpat, Barreily, Bijnor, Bulandshahar, Etah, Firozabad, GB nagar Hapur, Jotiba Phule Nagar, Mainpuri, Meerut, Muradabad, Muzaffernagar, Pilibhit, Rampur, Sambhal and Shahjahanpur districts of West Uttar Pradesh. Weather remained dry over rest of the region.

Advisories:

- As **Dense fog** in isolated pockets/ places very likely over Uttarakhand on 20th, over Punjab, Haryana, Chandigarh & Delhi, Uttar Pradesh from 20th to 24th, over Rajasthan on 20th, 21st and 22nd in the morning hours, in some pockets over Haryana, Chandigarh & Delhi and West Uttar Pradesh on 23rd and 24th, monitor the standing crops for incidence and spread of pest & diseases and monitor tomato and potato crops for blight disease. If symptoms are noticed, undertake plant protection measures.
- As **Cold wave conditions** very likely in isolated pockets over East Uttar Pradesh on 20th, with **Severe cold day conditions** in most pockets very likely over Haryana, Chandigarh & Delhi and Uttar Pradesh, **cold day conditions** in few pockets with **severe cold day** in isolated pockets Himachal Pradesh, Uttarakhand and Punjab and **Cold day conditions** in isolated pockets over Jammu & Kashmir and Rajasthan on 20th; in many pockets with **severe cold day** in some pockets very likely over East Uttar Pradesh; with **severe cold day** in isolated pockets over Punjab, Haryana, Chandigarh & Delhi and West Uttar Pradesh and **Cold day conditions** in some pockets over Himachal Pradesh and in isolated pockets over Jammu & Kashmir, Uttarakhand on 21st; very likely in isolated pockets over Jammu & Kashmir, Himachal Pradesh on 22nd and over Punjab, Haryana, Chandigarh & Delhi and Uttar Pradesh on 22nd, 23rd and 24th 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. Keep the animals inside the sheds and provide dry bedding and use heaters inside cattle sheds to protect them from cold.

Jammu & Kashmir

- In Sub Tropical Zone, apply cypermethrin 10EC @ 1ml/litre or chloropyriphos 3EC @ 2ml/litre to control mustard sawfly. Carry out hoeing and weeding operation in chick pea, pea and lentil. Carry out earthing up operation in potato. Undertake pruning in citrus orchard.
- In Cold Arid Zone, Keep the vents of greenhouses closed during cloudy days. Cover the Polyhouses to conserve energy. Limit irrigation in trenches. Stop irrigating orchards or nurseries in open. Drain out excess water to avoid frost damage. However, the protected nurseries must be irrigated few times during the winters (once or twice a month). Remove and bury all the fallen fruits in the orchards deep in soil to reduce codling moth infestation in the coming year.
- In Valley Temperate Zone, provide drainage in the Rabi crop fields wherever there is probability of water accumulation during winter months and make bunds and irrigation channels clean. Complete transplantation of onion seedlings.

Himachal Pradesh

- In High Hill Temperate Dry Zone, after completing the excavation of the pit for apple plantations, start filling up the pits with dung manure, superphosphate and pesticides etc. and pit should be 15-20 cm above the ground. Cover the small plants with grass to avoid cold.
- In Mid Hills Sub-Humid Zone, undertake transplanting of onion and sowing of pea..

Punjab, Haryana and New Delhi

- In Western Zone of Punjab, undertake sowing of short duration varieties of wheat crop. Complete transplanting of tomato. Complete sowing of radish, turnip and carrot.
- In Sub-Montane Undulating Zone of Punjab, apply irrigation to wheat at CRI stage. Carry out hoeing operation in mustard, rapeseed and black gram.
- In Western Zone of Haryana, complete sowing of late sown wheat and barley crops. Undertake intercultural operations for conserving the moisture and removing weeds in mustard crop and regularly check the mustard crop for pest population.
- In Delhi, stop irrigation for next few days as sufficient moisture is available in all the crops. Carry out thinning and weeding operation in late sown mustard crop. Undertake transplantation of onion. Carry out earthing up operation in potato crop.

Uttar Pradesh

- In East Uttar Pradesh, after sowing of Gram perform first irrigation between 45 to 60 days interval. For the treatment of Rust disease of wheat apply zinc carbonate 2kg dissolved in 1000 liters water and spray twice at 10 days interval. Apply Irrigation after 30-35 days during sowing of barely at tillering stage. Undertake sowing of sow late maturing varieties of wheat if soil moisture is adequate & use good quality wheat seeds.
- In West Uttar Pradesh, temperature is favorable for sowing of wheat with assured irrigation. Undertake harvesting of rapeseed crops. Undertake hoeing and weeding can be done between 15 to 20 days in mustard after sowing and the gram in 30 to 35 days after sowing and in pea after 20 to 25 days after sowing. In potato crop weeding and hoeing may be done and urea is top dressing. Undertake nursery planting of Onion.

To prevent the plum fruits from falling, spray the Super 6 hormone 1.0 ml per 4.5 liter

water solution in clear sky. In Banana trees support the plants with bamboo or wood when the flowers and fruits emerge.

Uttarakhand

- In Bhabar and Tarai Zone, to control the leaf spot disease in mustard, spray solution of mancozeb @ 2.5 g/litres of water. To prevent crops from frost/ fog, timely irrigation should be applied in the wheat field. On the occurrence of yellowish brown spot in tomato, spray mancozeb 2.5-3g/litres of water. If lower leaves of pea are turning yellow and plants are drying, then roots of pea crop should be irrigated with the solution of carbendazim @ 1 g/ litre of water. Carry out weeding and hoeing operation in cauliflower and cabbage.
- In Sub-Humid Sub-Tropic Zone, carry out weeding operation in wheat crop. Carry out weeding operation in potato. Carry out weeding and thinning operations in mustard.

Rajasthan

- In Flood Prone Eastern Plain Zone, carry out weeding operation in wheat crop. Spray a solution of mancozeb @ 2g/ litre water to manage early blight in potato crop. Sawfly infestation may occur in mustard and other brassica, apply 5% Melathion or 5% Carbaryl powder @ 20-25 kg/ha.
- In Arid Western Plain Zone, apply light and frequent irrigation in cumin crop. Continue sowing of wheat and barley (use late maturing varieties).
- In Transitional Plain Zone of Inland Drainage, apply irrigation in gram. Apply irrigation to wheat crop in CRI stage. Undertake transplanting of cabbage, cauliflower and broccoli.
- In Semi-Arid Eastern Plain Zone, continue sowing of late maturing varieties wheat. Pod borer attack may be seen in pea crop at pod formation stage. To control pod borer, spray Acephate 75 SP @ 1.5 gm per litre of water. To control mustard from aphids, spray Dimethoate 30 EC @ 1 litre per hectare. To control aphid insects attack in cauliflower and radish, spray Acephate 75 SP @ 1.5 gm per litre of water.
- In Sub Humid Southern Plain and Aravali Hill Zone, apply irrigation to mustard crop. To control pod borer in gram, undertake dusting of malathion 5% or methyl parathion 2% or quinalphos 1.5 % @ 25

kg/ha before flowering and after pod formation stage. Apply irrigation in wheat crop at CRI stage.

Animal Husbandry

- In Himachal Pradesh, protect animals from cold by keeping them in clean and closed sheds. Give balanced diet to the animals. Give 40 to 50 g minerals mixture to a cow daily.
- In Uttar Pradesh, Ensure that poultry should be provided with light for 15-16 hours during days' time. Give proper & balanced diet to farm animals and protect them from cold. Vaccinate cattle against H.F. and B.Q.disease.

Apiculture:

- In Sub Tropical Zone of Jammu & Kashmir, protect honey bee colonies from cold by providing winter packing. Reduce the entrance. Give sugar feeding. Migrate colonies to areas having floral resources (near toria/vegetable crops).

Floriculture:

- In Sub Tropical Zone of Jammu & Kashmir, undertake staking in chrysanthemum. Carry out earthing up operation in Gladiolus plants. Prune the dry and old shoots of rose plants.

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