

Significant weather and realized rainfall during last week:

- Significant rainfall occurred in Kinnaur, Kullu, Shimla districts of Himachal Pradesh, Chamoli Garhwal Pauri, Rudraprayag districts of Uttarakhand, Burhanpur, Harda districts of West Madhya Pradesh, Alappuzha district of Kerala. Mainly dry weather prevailed over rest parts of the country.
- During the last week, no cold wave/cold day conditions observed over the country.

Central India

- In view of occurrence of rainfall at many places during next 48 hours over Madhya Pradesh and Chattisgarh, the farmers are advised to postpone irrigation, inter-cultural operation and application of plant protection measures and fertilizers to the standing crops.
- In view of likely thunder squall and/ or hailstorm at one or two places during next 48 hours over Madhya Pradesh and over Chattisgarh on 16th February, farmers are advised to use hail net for orchard crops to protect from mechanical damage.
- As cloudy weather and rainfall is expected, farmers in Vindhya Plateau Zone of Madhya Pradesh are advised to postpone harvesting of matured early varieties of gram.

Northwest India

- As rain would occur at most places over Jammu & Kashmir, Himachal Pradesh and Uttarakhand and at many places over Punjab, Haryana, Delhi, Uttar Pradesh during next 48 hours, farmers are advised to postpone irrigation, inter-cultural operation and application of plant protection measures and fertilizers in standing crops.
- As heavy rain / snowfall (4-7 cm) would occur at most places over Jammu & Kashmir, Himachal Pradesh and Uttarakhand during next 48 hours, farmers are advised to arrange for adequate drainage to avoid water stagnation in the crop field.
- As thundersquall and / or hailstorm may occur at one or two places over Punjab, Haryana, Delhi, Rajasthan and Uttar Pradesh during next 48 hours, farmers are advised to use hail net for orchard crops to protect from mechanical damage.
- In Cold Arid Zone of Jammu & Kashmir, keep newly planted apricot & apple plants covered with gunny bags during these days to prevent from excessive cold. Cover the polythene of greenhouses with black polythene in the night for proper growth of crops or maintain two layers of polythene over greenhouse.
- In East Uttar Pradesh, farmers are advised to arrange bamboo support to banana plants and drain out excess water from the fields of pulses and maize.
- In Punjab, Delhi and Haryana, prevailing weather would be favourable for yellow rust disease in wheat crops. If disease appears, spray the crop with Tilt @ 200 ml in 200 liter water per acre after current spells of rain.
- In Sub-Humid Southern Plain and Aravalli Hill Zone of Rajasthan, there is chance of attack of aphids on late sown mustard crop due to favourable weather conditions. Farmers are advised to spray Malathion 50 EC @ 1.25 litre / ha or Dimethoate 30 EC @ 1 litre / ha after current spells of rain.

East India

- As rain / thundershowers are likely to occur in the States of the region during the period, farmers are advised to postpone irrigation to the standing crops. As rain is likely to occur at many places over Bihar during next 48 hours, farmers are advised to postpone inter-cultural operation and application of fertilizers and plant protection measures.
- As thundersquall and / or hailstorm may occur at one or two places over Bihar on 16th February, farmers are advised to use hail net for orchard crops to protect from mechanical damage.
- Farmers in Jharkhand are advised to undertake harvesting of rapeseed and mustard immediately and store the harvested products at a safe place.
- Due to cloudy weather condition in New Alluvial Zone and Laterite and Red Soil Zone of West Bengal, there is a chance of attack of rust and blight diseases in wheat. Apply Mancozeb @ 2.5 to 3 g per litre on a non-rainy day.
- Pod borer has occurred in gram and pea in Eastern Ghat High Land Zone of Odisha; farmers are advised to spray 50 ml Imidacloprid or 400 ml Dimethoate or Metasystox in 200 litre water per acre on a non-rainy day.
- Tikka disease has occurred in *rabi* groundnut in North Eastern Ghat Zone (G. Udaygiri) of Odisha. Farmers are advised to spray 500 g Blitox-50 in 200 litres of water per acre for tikka disease.

(Continued on Page 2)



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The bulletin is also displayed in the website (<http://www.imdagrimet.gov.in>) of the Division

Executive Summary

(Continued from page no. 1)

Northeast India

- As dry weather prevailed over the States of the region during last week and no significant rain is likely to occur during the period, farmers are advised to apply irrigation to the standing crops.
- In Barak Valley Zone of Assam, there is infestation of aphids, jassids and beetles in French bean; farmers are advised to spray Malathion 50 EC @ 1.5 ml / litre of water on a non-rainy day to control the attack.
- Due to humid and cloudy weather conditions, there is chance of attack of late blight in tomato in Hill Zone of Assam; farmers are advised to apply Ridomil MZ-72 @ 2 g per litre of water on a non-rainy day. Apply Indofil M-45 @ 2.5 g / litre of water at an interval of 15 days.
- Due to prevailing weather conditions in Mild Tropical Plain Zone of Tripura, there is chance of attack of late blight in potato and powdery mildew in pea and beans; farmers are advised to spray Mancozeb (Indofil M-45) @ 2.5 g per liter of water in potato field at least twice at an interval of 15 days for late blight and wettable sulphur @ 2 g per litre of water or to dust Sulphur at 25 kg / ha on pea and beans for powdery mildew as precautionary measures.
- In Mild Tropical Hill Zone of Mizoram, Mild Tropical Hill Zone of Nagaland and Sub-Tropical Hill Zone of Arunachal Pradesh, farmers are advised to provide good shelter by additional bulbs in poultry, heating system to cattle shed or tie gunny bag on back to protect from cool temperature.

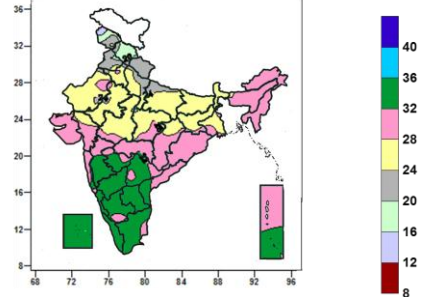
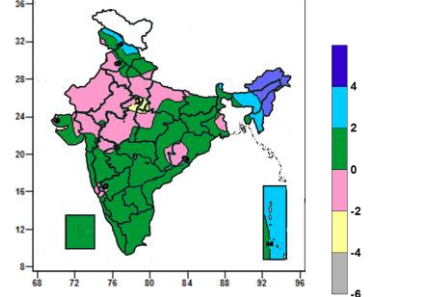
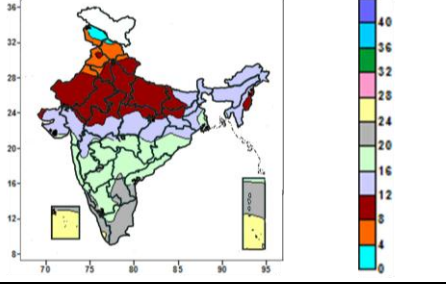
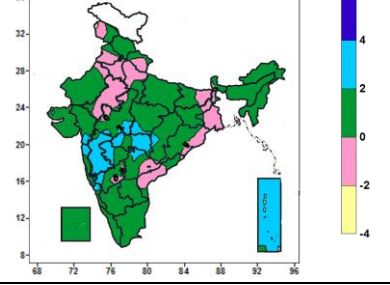
West India

- As there was unseasonal rain accompanied by hail and squally wind on 11th February in some pockets of Nasik, Jalgaon, Dhule and Nandurbar districts of North Madhya Maharashtra, crops like wheat, gram, chilli, papaya, banana and grapes are likely to be affected. Farmers are advised to postpone irrigation to standing crops, clean the orchards by collecting the infested fruits, leaves and branches to avoid further infestation. They are also advised to give physical support to the banana and papaya plants which are bent by squally wind.
- As rain / thundershowers would occur at many places over Vidarbha during next 48 hours, farmers are advised to postpone harvesting of gram, jowar and linseed. They are also advised to postpone irrigation to summer groundnut, sesame, green gram, orchards and vegetable crops and also postpone intercultural operation and application of fertilizers and plant protection measures.
- As thundersquall and / or hailstorm may occur at one or two places over Vidarbha on 16th February, farmers are advised to use hail net for orchard crops like orange to protect from mechanical damage.
- As dry weather prevailed over most parts of the South Madhya Maharashtra, Marathwada and Konkan and in Gujarat State and mainly dry weather would also prevail during the period, farmers are advised to apply irrigation to the standing crops.
- Due to unseasonal rain and cloudy weather in North Madhya Maharashtra, there may be incidence of powdery mildew on grapes, vegetables and mango, black aphids on wheat in Nasik region; spray Cypermethrin @ 3 ml in 10 litres of water against powdery mildew and spray Imidachloprid @ 5 ml in 10 litres of water for the control of aphids.
- Under present weather condition there may be occurrence of rust in wheat in Vidarbha region of Maharashtra; farmers are advised to apply Dithane-M-45 @ 25 g in 10 litres of water after current spells of rain, on appearance of the disease.
- In North Gujarat Zone, weather condition is favorable for occurrence of aphids in mustard; to control apply Phosphamidon @ 3 ml in 10 litres of water.

South India

- In the Problem Area Zone of Kerala, farmers are advised for planting of banana and sowing of vegetables like amaranthus, bhindi, cabbage and cauliflower.
- In Eastern Dry Zone of Karnataka, low temperature in morning hours is congenial for powdery mildew in mango and grapes and also leaf hopper in mango. Farmers are advised to undertake plant protection measures on a non rainy day.
- There is a chance for infestation of the sucking pests including hoppers, thrips and white flies in rice fallow black gram due to prevailing weather condition in the Cauvery Delta Zone of Tamil Nadu. Farmers are advised to spray Azadiractin at 0.03% or Triazophos at 2.5 ml/lit of water on a non rainy day to control them.
- As thundersquall and / or hailstorm may occur at one or two places over Telangana on 16th February, farmers are advised to use hail net for orchard crops to protect from mechanical damage.
- In Problem Area Zone of Kerala, in the prevailing weather condition, attack of stem borer, leaf folder and attack of white backed plant hopper is noticed in paddy fields. Farmers are advised to apply plant protection measures on a non rainy day to control stem borer and leaf folder and to control white backed plant hopper, farmers are advised to drain off the field completely. Present weather condition favours outbreak of brown plant hopper (BPH) and blast disease. Farmers are advised to remove the severely affected plants to reduce the spread of the disease to the nearby plants. Weather is conducive for the incidence of powdery mildew in cucurbits. Farmers are advised to apply plant protection measures on a non rainy day.

Contour maps for Mean Maximum and Minimum Temperature and their anomaly for the week ending on 13.02.2013

<p>Actual Mean Maximum Temperature (°C) in India for the week ending 13.02.2013</p> 	<p>Mean Maximum Temperature (°C) Anomaly in India for the week ending 13.02.2013</p> 
<p>Actual Mean Maximum temperature ranged between 32 to 36°C over many parts of Madhya Maharashtra, Marathwada, Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Lakshadweep Islands, some parts of Vidarbha, Goa, Andaman & Nicobar Islands, 12 to 16°C over some parts of Jammu & Kashmir, 16 to 20°C over many parts of Himachal Pradesh, some parts of Jammu & Kashmir, 20 to 24 over many parts of Jammu & Kashmir, Uttarakhand, Punjab, some parts of Uttar Pradesh, Himachal Pradesh, Haryana, West Rajasthan, 24 to 32°C over remaining parts of the country.</p>	<p>Mean Maximum temperature anomaly ranged between 4 to 6°C over many parts of Arunachal Pradesh, Nagaland, Manipur, some parts of Assam & Meghalaya, Mizoram, 2 to 4°C over many parts of Andaman & Nicobar Islands, Mizoram, some parts of Jammu & Kashmir, Himachal Pradesh, Assam, Tripura, -4 to -2°C over some parts of Uttar Pradesh, Madhya Pradesh, -2 to 2°C over rest of the country.</p>
<p>Actual Mean Minimum Temperature (°C) in India for the week ending 13.02.2013</p> 	<p>Mean Minimum Temperature (°C) Anomaly in India for the week ending 13.02.2013</p> 
<p>Actual Mean Minimum Temperature ranged between 24 to 28°C over many parts of Lakshadweep, some parts of Andaman & Nicobar Islands, 20 to 24°C over many parts of Rayalaseema, Kerala, Tamil Nadu, Coastal Karnataka, Andaman & Nicobar Islands, some parts of Telangana, Coastal Andhra Pradesh, South Interior Karnataka, Lakshadweep Islands, 4 to 8°C over many parts of Himachal Pradesh, Punjab, some parts of Jammu & Kashmir, Uttarakhand, Haryana, West Rajasthan, 0 to 4°C over some parts of Jammu & Kashmir, 8 to 20°C over remaining parts of the country.</p>	<p>Minimum Temperature anomaly ranged between 2 to 4°C over many parts of Madhya Maharashtra, Vidarbha, Andaman & Nicobar Islands, some parts of Gujarat, Madhya Pradesh, Chattisgarh, Konkan, Marathwada, Telangana, Coastal & North Interior Karnataka, -4 to -2°C over some parts of Jammu & Kashmir, -2 to 2°C over rest of the country.</p>

Distribution of rainfall of the country during week ending on 13.02.2013

State/Districts	Actual (mm)	% Dep.
Himachal Pradesh		
Bilaspur	0.6	-96
Chamba	0.0	-100
Hamirpur	0.7	-95
Kangra	0.6	-97
Kinnaur	41.0	56
Kullu	20.9	0
Lahaul and Spiti	3.3	-90
Mandi	12.1	-16
Shimla	22.0	34
Sirmaur	4.8	-67
Solan	7.8	-33
Una	0.0	-100
West Madhya Pradesh		
Alirajpur	0.0	-100
Asoknagar	10.8	247
Badwani	0.0	-100
Betul	4.3	59
Bhind	0.0	-100
Bhopal	4.8	140
Burhanpur	29.4	5780
Datia	3.0	-19
Dewas	0.0	-100
Dhar	6.2	931

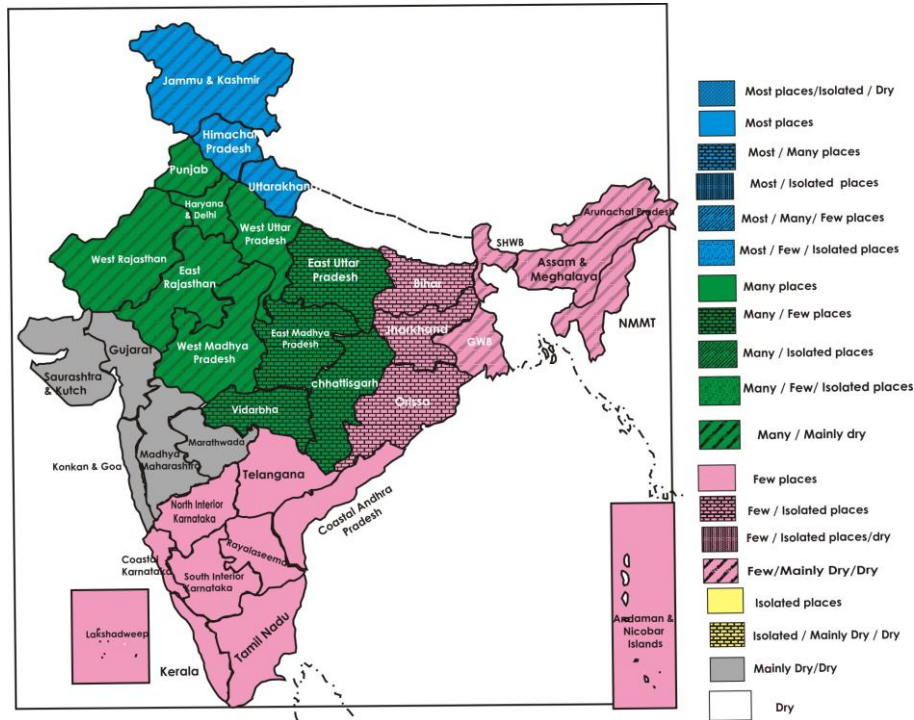
Guna	7.5	168
Gwalior	0.0	-100
Harda	27.1	1188
Hosangabad	17.4	461
Indore	10.2	918
Jhabua	0.0	-100
Khandwa	9.0	429
Khargone	12.2	2340
Mandsaur	0.0	-100
Morena	0.0	-100
Neemuch	0.0	-100
Raisen	0.0	-100
Rajgarh	9.4	423
Ratlam	6.2	933
Sehore	12.2	456
Shajapur	12.0	700
Sheopur Kalani	0.0	-100
Shivpuri	0.0	-100
Ujjain	1.0	-29
Vidisha	0.7	-81
Uttarakhand		
Almora	7.0	-30
Bageshwar	12.6	26
Chamoli	21.9	30
Champawat	4.0	-55
Dehradun	15.0	50

Garhwal Pauri	29.3	331
Garhwal Tehri	15.3	28
Haridwar	10.3	6
Nainital	14.1	78
Pithorgarh	14.0	40
Rudraprayag	30.6	71
Udham Sing Nagar	7.9	49
Uttarkashi	17.0	-15
Kerala		
Alappuzha	23.0	174
Kannur	0.0	0
Ernakulam	10.8	116
Idukki	3.0	-29
Kasaragod	0.0	0
Kollam	7.3	-5
Kottayam	11.8	93
Kozhikode	0.0	-100
Malappuram	0.0	-100
Palakkad	0.0	-100
Pathanamthitta	16.4	66
Thiruvananthapuram	11.2	138
Thrissur	3.1	245
Wyanad	0.8	-11

Legends

	(20% or more) excess rainfall		(-60 to -99 %) scanty rainfall
	(-19 to +19%) normal rainfall		(-100%) no rainfall
	(-20 to -59%) deficient rainfall	**	Data not available

Weather Forecast (Valid upto 0830 hours of 18th February, 2013)



Major Feature of Weather Forecast up to 0830 hours IST of 18th February, 2013

- Rain/snow would occur at a most places over Jammu & Kashmir, Himachal Pradesh and Uttrakhand during next 48 hours and decrease thereafter.
- Rain/thundershowers would occur at many places over Punjab, Haryana, Delhi, Uttar Pradesh, during next 48 hours and decrease thereafter.
- Rain/thundershowers would occur at many places over Rajasthan, Madhya Pradesh, Bihar and Chhattisgarh during next 48 hours and decrease thereafter.
- Rain/thundershowers would occur at one or two places over Jharkhand, Maharashtra, Odisha and West Bengal & Sikkim during next 24 hours and increase thereafter.
- Rain/thundershowers would occur at a many places over Tamilnadu, Andaman & Nicobar Islands, Kerala and Lakshadweep.
- Rain/thundershowers would occur at a few places over Karnataka and Andhra Pradesh.
- Rain/thundershowers would occur at a few places over Arunachal Pradesh and Assam & Meghalaya from 16th and 17th.
- Minimum temperatures would rise and maximum temperatures would fall by 2-4°C over northwest and adjoining central India during next 24 hours.
- Mainly dry weather would prevail over rest parts of the country.

Weather Warning during next 3 days

- Heavy rain/snowfall (4-7cm) would occur at most places over Jammu & Kashmir, Himachal Pradesh and Uttrakhand during next 48 hours.
- Thunder squall and /or hailstorm may occur at one or two places over Rajasthan and Madhya Pradesh during next 48 hours.
- Thunder squall and /or hailstorm may occur at one or two places over Punjab, Haryana, Delhi, Uttar Pradesh during next 48 hours and over Bihar, Chhattisgarh, Vidarbha and Telangana on 16th.

Weather Outlook for subsequent 4 days from 18th to 22nd February, 2013

- Significant decrease in precipitation activity over northwest and central India.
- Scattered to fairly widespread rain/thundershowers would occur over northeastern states on 18th and decrease thereafter.
- Rain/thundershowers would occur at a few places over extreme south peninsular India.

Zonewise Agromet Advisories

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

- **Realised Rainfall:** Dry weather prevailed over the states of the region during last week.
- **Weather Forecast:** Rain / thundershowers would occur at a few places over Arunachal Pradesh and Assam & Meghalaya from 16th and 17th February. Mainly dry weather will prevail over the states of the region during the period.
- **Advisories:**
 - As dry weather prevailed over the States of the region during last week and no significant rain is likely to occur during the period, farmers are advised to apply irrigation to the standing crops.
 - As prevailing weather is favourable for development of blossom end rot in tomato in Mild Tropical Hill Zone of Nagaland, farmers are advised for mulching in tomato to conserve soil moisture.
 - As mainly dry weather is prevailing, farmers in Sub Tropical Plain Zone of Manipur are advised to apply irrigation in rapeseed, field pea, maize and onion.
 - In Upper Brahmaputra Valley Zone of Assam, farmers are advised to undertake harvesting of potato immediately.
 - As dry weather favours the spread of powdery mildew in pea in Mild Tropical Hill Zone of Nagaland, farmers are advised to monitor pea against powdery mildew and take appropriate plant protection measures if incidence of disease occurs.
 - Attack of saw fly, cut worm and aphids in toria is observed at some places of Nagaon and Marigaon districts in Central Brahmaputra Valley Zone of Assam; farmers are advised to apply Dimethoate 30 EC or Chloropyrifos 20 EC @ 1 ml per litre of water in toria. Incidence of wilt disease and aphids has also been observed in lentil and lathyrus; farmers are advised to drench the soil with Bavistin @ 1 ml / litre of water to protect the crop from wilt and apply Malathion 50 EC @ 2 ml / litre of water for aphids. Due to present weather condition there is also chance of occurrence and spread of late blight disease in potato; spray Mancozeb 75% a.i. @ 2.5 g per litre of water. Apply the plant protection measures on a non-rainy day.
 - In Barak Valley Zone of Assam, there is infestation of aphids, jassids and beetles in French bean; farmers are advised to spray Malathion 50 EC @ 1.5 ml / litre of water on a non-rainy day to control the attack.
 - Due to favourable weather conditions, there is chance of attack of late blight in potato in North Bank Plain Zone of Assam. To control the attack, farmers are advised to spray Mancozeb @ 2.5 g / litre of water on a non-rainy day.
 - Due to humid and cloudy weather conditions, there is chance of attack of late blight in tomato in Hill Zone of Assam; farmers are advised to apply Ridomil MZ-72 @ 2 g per litre of water on a non-rainy day. Apply Indofil M-45 @ 2.5 g / litre of water at an interval of 15 days.
 - In Temperate Sub Alpine Zone of Meghalaya, due to congenial weather, there is chance of attack of aphids in toria, pea and lentil; farmers are advised to apply Dimethoate @ 2 ml per litre of water or Malathion 50 EC @ 1.5 ml per litre of water on a non-rainy day, if incidence is noticed.
 - Due to prevailing weather conditions in Mild Tropical Plain Zone of Tripura, there is chance of attack of aphids in toria, powdery mildew in pea and beans and late blight in potato; farmers are advised to spray Monocrotophos @ 2 ml per litre of water for the attack of aphids in toria, Mancozeb (Indofil M-45) @ 2.5 g per liter of water in potato field at least twice at an interval of 15 days for late blight and wettable sulphur @ 2 g per litre of water or to dust Sulphur at 25 kg / ha on pea and beans for powdery mildew as precautionary measures.
 - Other advisories are mentioned in Annexure - I
 - Stages of major crops are mentioned in Annexure II.
 - Suitable varieties of crops are mentioned in Annexure III.
- **Animal Husbandry**
 - Farmers in Central Brahmaputra Valley Zone of Assam are advised to protect poultry birds from cold by using electric bulb (300 Watt for 100 sq. feet) to prevent Coryza disease.
 - In Mild Tropical Hill Zone of Mizoram, Mild Tropical Hill Zone of Nagaland and Sub-Tropical Hill Zone of Arunachal Pradesh, farmers are advised to provide good shelter by additional bulbs in poultry, heating system to cattle shed or tie gunny bag on back to protect from cool temperature.

EAST INDIA [JHARKHAND, BIHAR, ORISSA, WEST BENGAL & SIKKIM]

- **Realised Rainfall:** Mainly dry weather prevailed over the region.
- **Weather Forecast:** Rain / thundershowers would occur at many places over Bihar during next 48 hours and decrease thereafter. Rain / thundershowers would occur at one or two places over Odisha, Jharkhand, West Bengal & Sikkim during next 24 hours and increase thereafter.
- **Weather warning:** Thunder squall and /or hailstorm may occur at one or two places over Bihar on 16th February.

- **Advisories:**

- As rain / thundershowers are likely to occur in the States of the region during the period, farmers are advised to postpone irrigation to the standing crops. As rain is likely to occur at many places over Bihar during next 48 hours, farmers are advised to postpone intercultural operation and application of fertilizers and plant protection measures.
- As thundersquall and / or hailstorm may occur at one or two places over Bihar on 16th February, farmers are advised to use hail net for orchard crops to protect from mechanical damage.
- Farmers in Jharkhand are advised to undertake harvesting of rapeseed and mustard immediately and store the harvested products at a safe place.
- Due to cloudy weather condition in New Alluvial Zone and Laterite and Red Soil Zone of West Bengal, there is a chance of attack of rust and blight diseases in wheat. Apply Mancozeb @ 2.5 to 3 g per litre on a non-rainy day.
- In the prevailing weather condition in Laterite and Red soil Zone of West Bengal leaf blight infestation may be high in chilli at flowering and fruiting stage. Apply 2.5 to 3 g Blitox per litre of water on a non-rainy day.
- Due to present weather condition in Old Alluvial Zone and Terai Zone of West Bengal, late blight and aphids may be infested in potato and mustard. To prevent the attack of late blight, spray Mancozeb (2 g / litre of water) and Blitox (4 g / litre of water) alternately at 10-12 days interval by completely wetting the leaves. To prevent attack of aphids, spray acephate 1 g / litre of water. Apply plant protection measures on a non-rainy day.
- Pod borer has occurred in gram and pea in Eastern Ghat High Land Zone of Odisha; farmers are advised to spray 50 ml Imidacloprid or 400 ml Dimethoate or Metasystox in 200 litre water per acre on a non-rainy day.
- In Western Undulating Zone and Eastern Ghat High Land Zone of Odisha, white fly and leaf miner infestation has been observed in tomato; farmers are advised to spray Imidacloprid 1 ml / 4 litre of water to control white fly and Triazophos 2 ml / litre of water for controlling leaf miner on a non-rainy day. Yellow mosaic vein disease has been reported in black gram and green gram crop in some areas. Uproot the infected plant and destroy it by burning.
- Alternaria blight infestation has been found in early planted onion in East and South Eastern Coastal Plain Zone of Odisha; farmers are advised to spray 3 g Dithane-M-45 in 1 litre water. Leaf eating caterpillar and leaf miner have been found in *rabi* sunflower; spray 400 ml Endosulphan / acre. Apply plant protection measures on a non-rainy day.
- Stem borer attack has been found on wheat crop in Jagatsingpur district of East and South Eastern Coastal Plain Zone of Odisha. Farmers are advised to spray 400 ml Triozophos or Prophenophos in 200 litre water / acre. Loose smut of wheat has been occurred. Uproot the affected plants and destroy them by burning and if required, spray 2 g Carbendazim / acre in 200 litres of water. Apply plant protection measures on a non-rainy day.
- Infestation of stem borer has been found on maize crop in Kendrapara district of East and South Eastern Coastal Plain Zone of Odisha; farmers are advised to release 20,000 eggs of *Trycograma chilonies* twice at 10 days interval or spray 2 ml Chloropyriphos or Monocrotophos or Quinalphos in 1 litre water or undertake whorl application of granular Carbofuran in the leaf whorls. Leaf eating caterpillar and leaf minor have been found on sunflower crop; spray 400 ml Endosulphan / acre. Apply plant protection measures on a non-rainy day.
- Tikka disease and white ant attack has occurred in *rabi* groundnut. Farmers of North Eastern Ghat Zone of Odisha are advised to spray 500 g Blitox-50 in 200 litres of water per acre for tikka and spray 2 ml Chloropyriphos in 1 litre water for controlling white ant attack. Bacterial wilt has been found in summer groundnut; spray 1 g Streptocycline / 10 litres of water thoroughly to the root zone. Apply plant protection measures on a non-rainy day
- In North Central Plateau Zone of Odisha, diamond backed moth infestation has occurred in cauliflower; farmers are advised to spray 2 ml Cartaf Hydrochloride per litre of water on a non-rainy day.

- **Pisciculture**

- Rise in temperature is favourable for growth of fishes. Farmers in Western Plateau Zone and South Eastern Plateau Zone of Jharkhand are advised to add cow dung and lime in the pond as natural foods for them and alternative feeds may also be used like rice bran and mustard cake (each of 5 kg per day per acre area of pond).
- Other crop advisories are mentioned in Annexure I.
- Stages of major crops are mentioned in Annexure II.
- List of Varieties are mentioned in Annexure III.

WEST INDIA [GOA, MAHARASHTRA, GUJARAT]

- **Realised Rainfall:** Some rain occurred in Dhule, Jalgaon, Nandurbar and Nasik districts of Maharashtra. Mainly dry weather prevailed over most of the remaining districts of Maharashtra and dry weather prevailed over Gujarat during last week.
- **Rainfall Forecast:** Rain / thundershowers would occur at many places over Vidarbha during next 48 hours and decrease thereafter. Mainly dry weather would prevail over rest of the region.

- **Warning:** Thunder squall and /or hailstorm may occur at one or two places over Vidarbha on 16th February.
- **Advisories:**
 - As there was unseasonal rain accompanied by hail and squally wind on 11th February in some pockets of Nasik, Jalgaon, Dhule and Nandurbar districts of North Madhya Maharashtra, crops like wheat, gram, chilli, papaya, banana and grapes are likely to be affected. Farmers are advised to postpone irrigation to standing crops, clean the orchards by collecting the infested fruits, leaves and branches to avoid further infestation. They are also advised to give physical support to the banana and papaya plants which are bent by squally wind.
 - As rain / thundershowers would occur at many places over Vidarbha during next 48 hours, farmers are advised to postpone harvesting of gram, jowar and linseed. They are also advised to postpone irrigation to summer groundnut, sesame, green gram, orchards and vegetable crops and also postpone intercultural operation and application of fertilizers and plant protection measures.
 - As thundersquall and / or hailstorm may occur at one or two places over Vidarbha on 16th February, farmers are advised to use hail net for orchard crops like orange to protect from mechanical damage.
 - As dry weather prevailed over most part of the South Madhya Maharashtra, Marathwada and Konkan and mainly dry weather would also prevail during the period, farmers are advised to apply irrigation to wheat and regular irrigation to sugarcane, vegetables, orchard crops and summer groundnut.
 - Considering the prevailing minimum temperature (16 to 18⁰C), farmers in Pune region are advised to complete the sowing of summer bajra and groundnut.
 - As prevailing temperature is favourable, farmers are advised to complete planting of *suru* sugarcane in Madhya Maharashtra and Marathwada region.
 - As dry weather prevailed during last few weeks and is likely to prevail during the period in Bhal and Coastal Zone and in North Gujarat Zone, apply irrigation to wheat at flowering and grain formation stage and gram at pod formation stage.
 - Under expected dry weather in coming days, apply irrigation and fertilizer to sugarcane and wheat crops in South Gujarat Heavy Rainfall Zone and to wheat, garlic and summer groundnut in South Saurashtra Zone.
 - In South Gujarat Zone, in view of prevailing dry condition and increase in temperature, apply irrigation in wheat.
 - Weather is favourable for sowing of summer groundnut in North Gujarat Zone and in South Saurashtra Zone.
 - Due to increase in temperature in South Gujarat Heavy Rainfall Zone, carry out sowing of early maturing varieties of groundnut.
 - Due to unseasonal rain and cloudy weather in North Madhya Maharashtra, there may be incidence of powdery mildew on grapes, vegetables and mango, black aphids on wheat in Nasik region; spray Cypermethrin @ 3 ml in 10 litres of water against powdery mildew and spray Imidachloprid @ 5 ml in 10 litres of water for the control of aphids.
 - Due to cloudy weather and rise in minimum temperature, there may be incidence of aphids and rust in late sown wheat in Western Maharashtra Scarcity zone; spray Dipenconazole @ 10 ml or Tilt @ 10 g + Rogar @ 15 ml in 10 litres of water thrice at 10 days interval.
 - Cloudy weather and rise in humidity is congenial for the infestation of powdery mildew on vegetables and mango in Pune region; spray wettable Sulphur 80 % @ 20 g in 10 litres of water 2-3 times at 10 days interval on mild incidence. If infestation is more, spray Tridemorph @ 10 ml or Carbendazim 10 g in 10 litres of water.
 - Under present weather condition there may be occurrence of rust in wheat in Vidarbha region of Maharashtra; farmers are advised to apply Dithane-M-45 @ 25 g in 10 litres of water after current spells of rain, on appearance of the disease.
 - In North Gujarat Zone, weather condition is favorable for occurrence of aphids in mustard; to control apply Phosphamidon @ 3 ml in 10 litres of water.
 - Weather conditions are favourable for incidence of blight and powdery mildew in cumin in North Saurashtra Zone of Gujarat; spray 10 ml Hexaconazole 5 EC in 10 litres of water to prevent it. Garlic blight and onion purple blotch have been noticed in North Saurashtra Zone of Gujarat in garlic and onion; spray 25 gm Mencozeb 75% WP in 10 liters of water for control of garlic blight and onion purple blotch.
 - Other advisories are mentioned in Annexure I.
 - Stages of the crops are mentioned in Annexure II.
 - Varieties of the crops are mentioned in Annexure III.

- **Animal Husbandry**

- In North Saurashtra Zone of Gujarat farmers are advised that udder of milking animals must be properly cleaned with insecticide like Zinc Oxide or Boric powder, and cut the beaks of birds in the poultry under age of 15 weeks. Cover poultry house by gunny bags or cloth / plastic sheets and give dry fodder to animals for protection against cold.

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

- **Realised Rainfall:** Significant rainfall occurred in Kinnaur, Kullu and Shimla districts of Himachal Pradesh and Chamoli Garhwal Pauri and Rudraprayag districts in Uttarakhand during last week. Mainly dry weather prevailed over the rest region.
- **Weather Forecast:** Rain / snow would occur at most places over Jammu & Kashmir, Himachal Pradesh and Uttarakhand during next 48 hours and decrease thereafter. Rain / thundershowers would occur at many places over Punjab, Haryana, Delhi, Uttar Pradesh and Rajasthan during next 48 hours and decrease thereafter. Minimum temperatures would rise and maximum temperatures would fall by 2-4⁰C over northwest India during next 24 hours.
- **Weather Warning:** Heavy rain / snowfall (4-7 cm) would occur at most places over Jammu & Kashmir, Himachal Pradesh and Uttarakhand during next 48 hours. Thundersquall and / or hailstorm may occur at one or two places over Punjab, Haryana, Delhi, Rajasthan and Uttar Pradesh during next 48 hours.
- **Advisory:**
 - As rain would occur at most places over Jammu & Kashmir, Himachal Pradesh and Uttarakhand and at many places over Punjab, Haryana, Delhi, Uttar Pradesh during next 48 hours, farmers are advised to postpone irrigation, intercultural operation and application of plant protection measures and fertilisers in standing crops.
 - As heavy rain / snowfall (4-7 cm) would occur at most places over Jammu & Kashmir, Himachal Pradesh and Uttarakhand during next 48 hours, farmers are advised to arrange for adequate drainage to avoid water stagnation in the crop field.
 - As thundersquall and / or hailstorm may occur at one or two places over Punjab, Haryana, Delhi, Rajasthan and Uttar Pradesh during next 48 hours, farmers are advised to use hail net for orchard crops to protect from mechanical damage.
 - Due to chances of heavy snowfall on 16th and 17th February in Intermediate Higher Zone and fairly widespread rainfall / thundershowers / hailstorm in Subtropical and Intermediate Lower Zone of Jammu & Kashmir during 15-17th February, farmers are advised to store the harvested produce, if any, in safe place to avoid loss.
 - In Jammu & Kashmir, farmers are advised to drain out excess water from the fields to avoid crop damage due to water stagnation in mustard, wheat and pulse crops and to prevent rotting in vegetable crops under water logged conditions.
 - In Cold Arid Zone of Jammu & Kashmir, keep newly planted apricot & apple plants covered with gunny bags during these days to prevent from excessive cold. Cover the polythene of greenhouses with black polythene in the night for proper growth of crops or maintain two layers of polythene over greenhouse.
 - Farmers are advised to drain out excess water from wheat, barley, *rabi* maize and fodder berseem fields in Uttarakhand and from wheat, oilseed and vegetable crop fields in Low Hills Sub-montane Zone of Himachal Pradesh.
 - In East Uttar Pradesh, farmers are advised to arrange bamboo support to banana plants and drain out excess water from the fields of pulses and maize.
 - In Punjab, Delhi and Haryana, prevailing weather would be favourable for yellow rust disease in wheat crops. If disease appears, spray the crop with Tilt @ 200 ml in 200 liter water per acre after current spells of rain.
 - In Delhi, farmers are advised to monitor inflorescence rotting disease in marigold crop constantly. If symptoms are found, spray Bavistin @ 1 g / litre or indofil-M 45 @ 2 ml / litre water after current spells of rain. Wrapping of plastic sheets around mango trunk to prevent climbing of young mealy bugs should be done. Apply grease to seal any cracks in the polythene sheets.
 - In Sub-Humid Southern Plain and Aravalli Hill Zone of Rajasthan, there is chance of attack of aphids on late sown mustard crop due to favourable weather conditions. Farmers are advised to spray Malathion 50 EC @ 1.25 litre / ha or Dimethoate 30 EC @ 1 litre / ha after current spells of rain.
 - In Central Plain Zone of Uttar Pradesh, due to favourable weather conditions, there is chance of attack of aphids and saw fly on rapeseed and mustard; farmers are advised to apply Dimethoate 30 EC or Chloropyriphos @ 2 ml / litre with a spray volume of 500-700 litres / ha for hand sprayer & 200-250 litres / ha for power sprayer after current spells of rain.
 - Stages of major crops are mentioned in Annexure II.
 - Suitable varieties of crops are mentioned in Annexure III.

- **Animal Husbandry**

- In view of likely rainfall and cold weather, in Uttarakhand, it is advised to keep all animals inside the shed. Feed them with balance feed including a mixture of green & dry fodder. Keep the place of sitting neat and clean and provide fresh water.
- In Irrigated North Western Plain Zone of Rajasthan, infection like FMD and HS in cow, TPR and Pox in sheep and goats and CRD and Ranikhet in poultry birds may occur due to present weather conditions; on appearance of the symptom, it is advised to adopt proper vaccination of livestock and poultry.

SOUTH INDIA [TN, AP, KERALA, KARNATAKA, LAKSHADWEEP, ANDAMAN & NICOBAR ISLANDS]

- **Realised Rainfall:** No significant rainfall occurred over the States of the region during last week except in Alappuzha district in Kerala.
- **Rainfall Forecast:** Rain/thundershowers would occur at a few places over the region.
- **Warning :**Thundersquall and /or hailstorm may occur at one or two places over Telangana on 16th February.
- **Advisories:**
 - As significant rainfall occurred in Alappuzha district in Kerala and rainfall is likely, postpone irrigation to the standing crops.
 - In the Problem Area Zone of Kerala, farmers are advised for planting of banana and sowing of vegetables like amaranthus, bhindi, cabbage and cauliflower.
 - In the northern Zone of Kerala, farmers are advised to drain out water from the paddy fields completely for early and uniform hardening of the grains. Mulch the coconut and pepper basins to prevent evaporation loss of water. The season is ideal for cultivating vegetables as intercrops in coconut gardens.
 - In Eastern Dry Zone of Karnataka, low temperature in morning hours is congenial for powdery mildew in mango and grapes and also leaf hopper in mango. Farmers are advised to undertake plant protection measures on a non rainy day.
 - Due to low temperature, hoppers were noticed in mango crop in North East Transition Zone of Karnataka. Spraying of 4 g Carbaryl 50 WP or 2 ml Malathion 50 EC or 1.5 ml Monocrotophos 36 SL or 0.5 ml Phosphamidon 40 EC in one litre water on non rainy day is advised.
 - Farmers in North East Transition Zone of Karnataka are advised to spray Dicopal @ 0.5 ml/l on a non rainy day as Thrips incidence is observed on chilli and capsicum.
 - Farmers in Western Zone of Tamil Nadu are advised to drain water from rice field one week after tillering and during flowering stage, since prevailing temperatures may induce more tillers in rice. Farmers are also advised to go in for early harvest of sugarcane, since lodging is likely in mid-season planted sugarcane crop because of anticipated high wind speed.
 - There is a chance for infestation of the sucking pests including hoppers, thrips and white flies in rice fallow black gram due to prevailing weather condition in the Cauvery Delta Zone of Tamil Nadu. Farmers are advised to spray Azadiractin at 0.03% or Triazophos at 2.5 ml/lit of water on a non rainy day to control them.
 - Farmers in Western Zone of Tamil Nadu are advised to monitor for disease initiation in standing rice and groundnut crops, due to high evening relative humidity and high wind speed.
 - In Problem Area Zone of Kerala, in the prevailing weather condition, attack of stem borer, leaf folder and attack of white backed plant hopper is noticed in paddy fields. Farmers are advised to apply plant protection measures on a non rainy day to control stem borer and leaf folder and to control white backed plant hopper, farmers are advised to drain off the field completely. Present weather condition favours outbreak of brown plant hopper (BPH) and blast disease. Farmers are advised to remove the severely affected plants to reduce the spread of the disease to the nearby plants. Weather is conducive for the incidence of powdery mildew in cucurbits. Farmers are advised to apply plant protection measures on a non rainy day.
 - In central zone of Kerala, weather is favourable for incidence of sikatoka leaf spot in banana and leaf spot in amaranthus. Cut and burn all severely affected banana leaves and spray 1% Bordeaux mixture. Mulching may be done to retain moisture. Apply 4 g Dithane M 45 mixed in cleared cow dung water to control leaf spot in amaranthus on a non rainy day.
 - In High Altitude Zone of Kerala, incidence of pseudostem weevil is noticed widely in 3-4 months old banana. Remove the dry outer sheathes of the pseudostem of all infested and uninfested plants and spray Carbaryl 50 WP 4gm/litre of water on pseudostem on a non rainy day.
 - As thundersquall and / or hailstorm may occur at one or two places over Telangana on 16th February, farmers are advised to use hail net for orchard crops to protect from mechanical damage.
 - Incidence of blast is observed in rice and smut on sugarcane in the North Coastal Zone of Andhra Pradesh. Farmers are advised to spray tricyclozole @ 0.6 g/l to control blast incidence and spray of Propiconazole @ 1 ml/l for control of smut in sugarcane. Due to warm weather conditions, thrips may occur in the groundnut and

early shoot borer on sugarcane. If noticed spray Chlorpyrifos @ 2.5 ml/l for control of early shoot borer and spray dimethoate @ 2 ml/l for control of thrips in groundnut. Farmers are advised to apply plant protection measures on a non rainy day.

- Due to continuous rise of day temperatures over the week, leaf miner and aphid in groundnut, hoppers and gram caterpillar in chillies and tomato was noticed in the Scarce Rainfall Zone of Andhra Pradesh. Weather is congenial for incidence of *Spodoptera litura*, early leaf spot, and peanut stem necrosis disease in groundnut and stem borer in rice. Farmers are advised to undertake plant protection measures on a non rainy day.
- In the Southern Telangana Zone of Andhra Pradesh, weather is congenial for incidence of stem borer on rice and maize. Farmers are advised to undertake plant protection measures on a non rainy day.
- Due to prevailing dry weather, it is congenial for attack of stem borer on rice fallow maize and *Spodoptera* and *Helicoverpa* on Bengal gram, spray Chlorpyrifos @ 2.0 ml/l or Endosulfan @ 2.0 ml/l or Monocrotophos @ 1.6 ml/l or Acephate @ 1 g/l or Novaluron @ 1.0 ml/l or Flubendiamide @ 0.2 ml or Rynaxypir @ 0.3 ml/l for control of *Spodoptera* and *Helicoverpa* on Bengal gram and spray 2 ml. endosulphan/liter of water at 10-15 DAS or apply carbofuran granules @ 3 kg./acre in the whorls for control of stem borer on maize. Farmers are advised to undertake plant protection measures on a non rainy day.
- Other advisories are mentioned in Annexure – I.
- Stages of major crops are mentioned in Annexure II.
- List of Varieties are mentioned in Annexure III.

CENTRAL INDIA [M.P., CHHATTISGARH]

- **Realised Rainfall:** Significant rainfall occurred in Harda and Burhanpur districts of West Madhya Pradesh.
- **Weather forecast:** Rain / thundershower would occur at a many places over Madhya Pradesh and Chhattisgarh during next 48 hours and decrease thereafter.
- **Warning:** Thunder squall and / or hailstorm may occur at one or two places over Madhya Pradesh during next 48 hours and over Chhattisgarh on 16th February.
- **Advisories:**
 - In view of occurrence of rainfall at many places during next 48 hours over Madhya Pradesh and Chattisgarh, the farmers are advised to postpone irrigation, intercultural operation and application of plant protection measures and fertilizers to the standing crops.
 - In view of likely thunder squall and/ or hailstorm at one or two places during next 48 hours over Madhya Pradesh and over Chattisgarh on 16th February, farmers are advised to use hail net for orchard crops to protect from mechanical damage.
 - As cloudy weather and rainfall is expected, farmers in Vindhya Plateau Zone of Madhya Pradesh are advised to postpone harvesting of matured early varieties of gram.
 - In Kymore Plateau and Satpura Hill region of Madhya Pradesh, due to cloudy weather, there may be chances of occurrence of pod borer in chickpea, pigeon pea and lentil crops. Farmers are advised to monitor these crops and apply appropriate plant protection measures after current spells of rain.
 - Due to cloudy weather condition during last week in Chhattisgarh Plain Zone, incidence of *Heliothis* in gram is reported over many places and is likely to increase; farmers are advised to monitor the crop and apply insecticides like Indoxacarp @ 300 ml / ha or Carbaril @ 1 kg / ha after current spells of rain.
 - Stages of major crops are mentioned in Annexure II.
- **Animal Husbandary**
 - Farmers in Kymore Plateau and Satpura Hill region of Madhya Pradesh are advised to keep livestock under shaded condition to protect from rains. Also, use heaters to increase temperature during night hours to protect calves from cold.

Annexure I
Other Advisories

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

- In Hill Zone and Lower Brahmaputra Valley Zone of Assam, farmers are advised to undertake nursery raising of early *ahu* rice.
- In Upper Brahmaputra Valley Zone of Assam, farmers are advised to undertake land preparation / sowing of summer pulses.
- In Lower Brahmaputra Valley Zone of Assam, farmers are advised to undertake land preparation and sowing of summer crops like pumpkin, ridge gourd, sponge gourd etc.
- Farmers in Barak Valley Zone of Assam are advised to undertake land preparation for sowing of summer black gram and green gram.
- Farmers in North Bank Plain Zone of Assam are advised to continue land preparation for summer vegetables like ridge gourd, cucumber, bitter gourd, okra etc.
- In Temperate Sub Alpine Zone of Meghalaya, farmers are advised to continue nursery preparation of *boro* rice in West Garo Hills, West Khasi Hills and sowing of chilli and brinjal in East Khasi Hill, Jaintia Hills, Ri-bhoi and West Khasi Hills.
- In Mild Tropical Plain Zone of Tripura, farmers are advised to continue sowing of summer green gram and black gram and transplanting of summer brinjal and tomato.
- Farmers in Sub Tropical Plain Zone of Manipur are advised for transplanting of tomato, chilli and sowing of cucurbits, okra, French bean etc. Also undertake land preparation for nursery raising of *pre-kharif* rice and sowing of cauliflower and cabbage.
- Farmers in Mild Tropical Hill Zone of Nagaland are advised to continue nursery raising of cucurbits *viz*, sponge gourd, bitter gourd and pumpkin. Undertake land preparation for sowing of okra and transplanting of chilli and brinjal.

EAST INDIA [JHARKHAND, BIHAR, ORISSA, WEST BENGAL &SIKKIM]

- Farmers of Mid Central Table Land Zone of Odisha are advised for sowing of summer groundnut.
- Farmers of North Eastern Coastal Plain Zone of Odisha are advised to undertake sowing of sunflower.
- Farmers in Jharkhand are advised to transplant seedlings of summer rice and prepare field for sowing of long gourd, round gourd, bitter gourd, sponge gourd, cucumber, water melon and musk melon.
- Farmers in Western Plateau Zone and South Eastern Plateau Zone of Jharkhand are advised to undertake sowing of summer mung, summer vegetables like cauliflower, cabbage, chilli.
- Farmers in New Alluvial Zone of West Bengal are advised to prepare land for sowing of sesame, lady's finger, *Kakrol* and Amaranthus.
- Farmers are advised to undertake sowing of groundnut in Laterite and Red soil Zone and sowing of moong and sesame in Coastal Saline Zone of West Bengal.
- Farmers in *Terai* Zone of West Bengal are advised to undertake transplanting of *boro* rice.

WEST INDIA [GOA, MAHARASHTRA, GUJARAT]

- Farmers in North Saurashtra Zone of Gujarat are advised to undertake sowing of summer groundnut, black gram, green gram and summer vegetables *viz*, lady's finger, cluster bean, bottle guard, sponge guard, ridge guard, bitter guard, water melon and transplanting of tomato and brinjal.
- Carry out picking of capsules of castor during early morning hours in Bhal and Coastal Zone and North West Zone of Gujarat, Middle Gujarat Zone and South Saurashtra Zone of Gujarat. Carry out sowing of okra, cluster bean and cowpea and transplanting of brinjal in South Gujarat Heavy Rainfall Zone and in North Gujarat Zone.

SOUTH INDIA [TN, AP, KERALA, KARNATAKA, LAKSHADWEEP, ANDAMAN & NICOBAR ISLANDS]

- In the High Altitude Zone of Kerala it is the ideal time for mulching in pepper and arecanut gardens to conserve the moisture. Farmers are also advised to plough the paddy field after the harvest for taking next crop and allow the stubbles to decay and select short duration varieties for the summer crop.
- In the southern zone of Kerala, farmers are advised to apply fertilizers in paddy on a non rainy day and provide mulching to coconut and banana crops.
- Farmers in Hill Zone of Karnataka are advised to sow sunflower.
- Farmers are advised for sowing of groundnut, cowpea and greengram, planting of sugarcane in Northern dry Zone of Karnataka.
- Farmers in the North East Dry Zone are advised for paddy transplanting.
- Farmers in the Eastern Dry Zone are advised to harvest bengal gram.

- In the Cauvery Delta Zone of Tamil Nadu, the harvest of the matured *samba and thaladi* paddy may be taken up.
- Farmers are advised to sow summer irrigated maize, cotton and sorghum in Southern Zone, cotton in North Western Zone and potato and carrot in High Altitude and Hilly Zone of Tamil Nadu.
- In the Problem Area Zone of Kerala, weather is favourable for sowing of cabbage and cauliflower and irrigate the already sown bhindi crop at 2-3 days interval.
- Farmers in the Scarce rainfall zone of Andhra Pradesh are advised to clip terminal leaves to avoid rice stem borer incidence before transplanting of rice to the main field and maintain 20 cm space (Alleys) for every 2m to avoid the pest and disease incidence by allowing good aeration and sunlight and standing water in the field.
- Farmers in the Southern Telangana zone of Andhra Pradesh are advised to undertake planting of sugarcane by soaking three budded setts in 300 ltrs. of solution containing 150 g Carbendazim + 600 ml and Malathion for 15 minutes to control scale insects and diseases before planting.
- Farmers in the South Coastal zone of Andhra Pradesh are advised to undertake short duration and pest resistant varieties of summer cotton and irrigated dry crops instead of rice.
- Farmers in the North Telangana zone of Andhra Pradesh are advised to undertake planting of sugarcane.
- **Animal Husbandry**
 - Due to slightly elevated relative humidity in the North Western Zone of Tamil Nadu, feed ingredients are likely to have fungal attack. Farmers are advised to avoid usage of high moisture feed ingredients for feed preparation. Post mortem observations in birds brought for the diagnostic purpose at Namakkal revealed death of birds due to *E.coli and upper respiratory infections*. Further, tested drinking water samples revealed high *E.coli* contamination. Farmers are advised to provide clean drinking water and follow proper bio-security measures in the farm.

Annexure II

Major Crops

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

- *Boro* rice (transplanting / tillering), *ahu* rice (nursery raising / sowing), cole crops (head formation / maturity / harvesting), wheat (tillering / ear head emergence / flowering), rapeseed, mustard (capsule formation / capsule maturity), potato (maturity / harvesting), tomato (flowering / fruiting), *rabi* pulses viz, lentil, rajmah, pea (pod formation / maturity), summer pulses (sowing / seedling), okra (sowing / seedling), cucurbits (sowing) in Assam.
- Cauliflower, cabbage (maturity / harvesting), potato (maturity / harvesting), pea (flowering / pod formation), rapeseed, mustard (capsule formation) in Arunachal Pradesh.
- Potato (tuber formation), pea (flowering / pod formation), cauliflower, cabbage (sowing), rapeseed (flowering / pod formation), onion, garlic (vegetative / bulb formation), *rabi* maize (vegetative), tomato, chilli (transplanting), beans (sowing / early vegetative), cucurbits (sowing) in Manipur.
- *Rabi* maize (vegetative), *boro* rice (tillering), cole crops (head formation), pea, lentil, mustard (flowering / pod formation), toria (pod formation), tomato (vegetative / flowering / fruiting), chilli, brinjal (sowing) in Meghalaya.
- Cole crops (head formation), beans (flowering / pod formation), pea, lentil (pod formation / pod maturity / harvesting), tomato (fruiting) in Mizoram.
- *Rabi* maize (vegetative), cabbage (head formation), mustard (capsule formation), tomato (flowering / fruiting), pea (pod maturity / harvesting), banana (fruiting), potato (tuber formation), cucurbits (nursery raising), chilli, brinjal (transplanting) in Nagaland.
- *Boro* rice (tillering), toria (pod formation), summer brinjal, tomato (nursery raising / transplanting), potato (tuber formation), pea, bean (flowering / pod formation), summer green gram and black gram (sowing) in Tripura.

EAST INDIA [JHARKHAND, BIHAR, ORISSA, WEST BENGAL &SIKKIM]

- Gram, peas, lentil (pod formation), sunflower, (flowering / head formation), maize(vegetative/flowering), sugarcane (planting), potato (tuber formation), mustard (capsule formation), urad, arhar (grain formation), winter vegetables (flowering / fruiting / harvesting), wheat (tillering) and toria (pod formation), pigeon pea (flowering / pod formation), summer vegetables(sowing) in Bihar.
- Wheat (jointing stage), potato (vegetative / tuber formation), pigeon pea (pod formation), onion (transplanting), vegetables (vegetative / flowering / fruiting / harvesting), gram, linseed, lentil, pea (vegetative / flowering / pod formation), Rice (seedling), rapeseed, mustard (harvesting) in Jharkhand
- Sugarcane (germination), banana (vegetative), mustard, sunflower, sesame, cowpea (vegetative / flowering / pod formation/maturity), *rabi* groundnut (pod formation), fruit crops (planting / seedling), summer rice (land preparation / transplanting), wheat (active tillering), tomato (flowering to fruiting stage), black gram & green gram (flowering initiation stage), summer groundnut (sowing) in Odisha.
- *Boro* rice (seedling / transplanting/tillering), wheat (panicle initiation/heading), vegetable (flowering / fruiting), potato (tuberization stage), mango (flowering), tomato (flowering / fruiting), mustard (flowering /capsule formation, pointed gourd, cucumber (flowering), onion (transplanting), groundnut (sowing), chilli (flowering/fruiting) in West Bengal.
- Ginger (sprouting / early vegetative), large cardamom (vegetative / primary flowering / secondary flowering), vegetables (vegetative), rice (grain formation / maturity) in Sikkim.

WEST INDIA [GOA, MAHARASHTRA, GUJARAT]

- *Adsali* sugarcane (cane maturity / harvesting), pre seasonal sugarcane (cane maturity / harvesting), *suru* sugarcane (cane maturity / harvesting in Madhya Maharashtra and Marathwada), new *adsali* sugarcane (early tillering), new pre seasonal sugarcane (early tillering), new *suru* sugarcane (planting), *rabi* jowar (grain maturity / harvesting in Madhya Maharashtra and Marathwada), safflower (seed maturity in Madhya Maharashtra and Marathwada), maize (cob initiation / cob maturity in Marathwada and Madhya Maharashtra), gram (pod development / pod maturity / harvesting), wheat (flowering / dough), rice (early tillering in South Konkan, in Western Ghat region and East Vidarbha), summer groundnut (germination / early vegetative in South Konkan and sowing / germination in Madhya Maharashtra, Marathwada and Vidarbha), Summer bajra (sowing / germination in Pune and Nashik region).
- Summer groundnut (sowing / germination / seedling), Summer rice (seedling / transplanting), summer vegetables (sowing / transplanting), wheat (flowering / milk), gram (pod formation / grain development), cumin (flowering / grain filling), sugarcane (planting / early vegetative / vegetative), castor (spike maturity / harvesting), winter vegetables (flowering / fruiting), chilli, brinjal (fruiting / harvesting), cauliflower (head formation / maturity), potato (tuber formation), mustard (pod formation), jowar (flowering / grain formation), *rabi* fennel (flowering / pod formation), fenugreek (flowering / pod formation), maize (tasseling / silking / cob initiation) in Gujarat.

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

- Wheat (jointing), pea (flowering / pod formation / maturity), radish (vegetative), pome and stone fruits (planting), cabbage, cauliflower (head formation), potato, tomato, brinjal (sowing) in Himachal Pradesh.
- Cauliflower, cabbage, broccoli (head formation / maturity), tomato (vegetative / flowering / fruiting), pea (vegetative / flowering / fruiting), carrot, radish and turnip (root development / maturity), mustard (pod filling), onion (vegetative), coriander, fenugreek (vegetative / flowering / fruiting), wheat (post tillering / late jointing), lady's finger, spinach (sowing) in Delhi.
- *Rabi* cereal (wheat), pulses (pea and lentil), brown sarson, fodder oat (in dormant stage in Valley Temperate zone (Srinagar)), sunflower (early vegetative / vegetative), garlic, cucurbits, okra (seedling / early vegetative), potato (planting), radish, spinach (sowing), carrot, turnip (sowing), onion, cole crops (nursery sowing / transplanting), mustard (late sown - flowering, normal / early sown - seed formation), wheat (late sown - tillering / jointing, normal / early sown - active tillering / ear head emergence), barley (tillering / jointing / flag leaf initiation), pulses (pea, lentil, gram) (vegetative / flowering / pod formation), oat, berseem (vegetative) in Jammu & Kashmir.
- Wheat (tillering / ear head emergence), arhar (flowering / pod formation), ginger (vegetative), autumn sugarcane (vegetative), yellow sarson, mustard (flowering / capsule formation), barley, oat (tillering / ear head emergence), chick pea, lentil (vegetative / flowering / pod formation), brinjal, chilli, lady's finger (vegetative / flowering / fruiting) in Uttarakhand.
- Wheat (tillering / ear head emergence), late sown wheat (tillering), barley (tillering / ear head emergence), sugarcane (harvesting), new sugarcane (planting), linseed, jai (vegetative / flowering), fodder berseem (vegetative / second cutting), radish, carrot (root development / harvesting), onion, garlic (vegetative), rapeseed, mustard, pea, lentil, gram (flowering / pod formation / grain formation) maize (flowering / pod formation / grain formation) in Uttar Pradesh.
- Wheat (tillering / jointing), sugarcane (harvesting), new sugarcane (planting), mustard (flowering / capsule formation) in Punjab.
- Wheat (tillering / jointing), sugarcane (harvesting), new sugarcane (planting), mustard (flowering / capsule formation), barseem (sowing / vegetative) in Haryana.
- Sugarcane (maturity / harvesting), maize (maturity), *capsicum*, guar, vegetables (tinda, water melon, pumpkin, cucumber, coriander, bhindi, ridge gourd) (sowing / germination / seedling), potato (tuber formation), mustard (flowering / capsule formation), gram (flowering / grain formation), wheat (tillering / active tillering), barley (tillering), opium poppy (pre-flowering / flowering) in Rajasthan.

SOUTH INDIA [TN, AP, KERALA, KARNATAKA, LAKSHADWEEP, ANDAMAN & NICOBAR ISLANDS]

- *Rabi* groundnut (pod development/pod maturity/harvest), *rabi* maize (vegetative /tasseling), sunflower (flowering / seed formation), *rabi* rice (transplanting / tillering), summer cotton (sowing), Bengal gram (flowering/pod development), red gram (pod development), cow pea and sesame (flowering / pod formation), rice fallow pulses (vegetative) and sugarcane (planting) in Andhra Pradesh
- Cowpea, black gram and green gram (harvesting), pigeon pea (harvesting), chilli (fruiting), sunflower (vegetative), chick pea (pod maturity), grapes (flowering / fruiting), October sown wheat (earhead filling), jowar (grain maturity), ragi (ear head emergence), maize (cob formation/cob maturity), horse gram (flowering / pod formation), groundnut(vegetative), mango (flowering/fruit setting), sugarcane (maturity / ripening) in Karnataka.
- Coconut (Harvesting), *Puncha* rice (tillering), rubber (tapping discontinued), vegetables (sowing/ early vegetative/harvesting), *mundakan* rice (maturity/harvesting), cardamom(new planting) in Kerala.
- Late *Samba* rice (flowering/maturity stage), *samba* rice (maturity/harvesting),thaladi (maturity/harvesting),sorghum (maturity/harvesting), rice fallow pulses (vegetative),rainfed groundnut (flowering/pod formation), cotton (boll maturity),sugarcane (vegetative /ratooning),maize(maturity/harvesting), redgram (flowering),summer sorghum, maize and cotton (sowing),vegetables (fruiting) in Tamil Nadu.

CENTRAL INDIA [M.P., CHHATTISGARH]

- Ladies finger, cucurbits (flowering / fruiting), pigeon pea,gram (pod formation/pod maturity/harvesting), potato (tuber formation/maturity/harvesting), sugarcane (planting/vegetative), *rabi* vegetables (flowering/fruiting), wheat (flowering/milking/grain filling), maize (vegetative), fodder crops (sowing), chickpea, lentil, mustard, linseed (pod/capsule formation) in Madhya Pradesh.
- Sugarcane (planting/vegetative), pigeon pea, groundnut (pod filling/maturity), sesame (late vegetative), ginger, turmeric, papaya, mango and guava (vegetative), onion (transplanting/bulb formation), vegetables (transplanting / vegetative), millet (vegetative), wheat (vegetative / flowering), niger, kulthi (vegetative) in Chhattisgarh.

Annexure III

List of Varieties

Assam

Ahu rice: Luit, Kopilee, Cauvery, Culture -1, Rasi, Lachit, Chilarai, Dichang.

Okra: Pusa Sawani, Parvani Kranti, Arka Anamika.

Black gram: T 9, Pant U 19, UG 157, JU 78.

Green gram: T 44, AAU 34, AAU 39, SG 1.

Pumpkin: Arka Suryamukhi, Arka Chandan.

Ridge gourd: Pusa Nasdar, AAUJ-1, AAUJ-2, AAUC-3.

Sponge gourd: Pusa Chikni.

Manipur :

French Bean: Dwarf type: Anupam, Pant Anupam.

Pole type: local variety (Tangkhul Hawaii).

Tripura:

Green gram: PDM 139.

Black gram: T-9, Panth Urd- 35.

Tomato: Anup.

Odisha

Groundnut: Smruti and JL-24, TMV-2, Devi, Phule Pragati, ICGS-44, TAG-24, TG-3 and TG 38.

Sugarcane: CO 740, CO 6304, CO7219, COT 8201, Neelamadhaba and Sabita.

Sesame: Vinayak, Kanak, Kalika, Uma, Usha.

Maize: Dhabal, Navjot, Decca, Ganga, Deccan 105, Kargil 900-M, PRO 345, Kargil 633.

Sunflower: Morden, PAC-36, KBSH, MSFH-8, SFH-7, KBSH-1, MSHF-1, MSFH-17.

West Bengal:

Boro Rice: Supriya, Jamini, Bhupen, IET-2233, Satabdi (IET-4786), Kitish (I.E.T.-4094), Ratna, Bikash etc.

Sesame: Rama, Tilottama, B64, B14.

Moong: Chaiti mung, Sonali, T44, PDM-84, Samrat, Basanti.

Groundnut: JL-24, J-11, AKG-12-24.

Jharkhand:

Onion: Pusa Red, Pusa Ratnar, N-53, Arka Nikatan, Arka Kalyan, Agrifound Dark Red.

Rice: IR-36, IR-64, Naveen, Lalat, MTU-1010.

Bihar:

Bhindi: Parvani Kranti, Arka Abhay, Arka Anamika, Barsha Uphar, KS 312, Okra 4, Punjab 7, Pant Bhindi 1

Summer Maize: Suwan, Deoki, Ganga 11, Shaktiman 1 and 2

Maharashtra

Suru Sugarcane: CO-419, COM-7125, CO-860032, CO-94012 and COM-0265 for Madhya Maharashtra and CO-86032, CO-M 7125, CO-8014, CO-740, CO-7219 for Marathwada region.

Summer sesame: AKT-101 and NT11-99.

Bajra: Shraddha, Saburi and Shanti.

Groundnut: SB11, JL286, TPG41, TAG24, TG26 and JL501.

Gujarat

Groundnut: TAG-24, GG-2, 5 & 7, TG-37-A, GG-4, GG-26.

Green Gram: Guj. Mung- 3, 4.

Jammu & Kashmir

Onion: Pusa Red, N-53.

Knolkhol: Purple Vienna and White Vienna.

Radish: Japanese White and Minowase.

Beans:

Bush types: Contender and Arka Komal; and

Potato: Kufri Jyoti.

Delhi

Lady's finger: A-4 and Parbhani Kranti.

Spinach: Pusa Harit hybrid varieties.

Rajasthan

Bottle gourd: Pusa Summer Prolific Long, Pusa Summer Prolific Round, Pusa Manjri, Pusa Navin, Pusa Meghdoot, Arka Bahar.

Pumpkin: Pusa Viswas, Pusa Alankar, Arka Chandan, Pusa Hybrid-1.

Khira: Balam Khira, Pusa Sayong, Painsate, Japanese Long Green, Pusa Alankar.

Bitter gourd: Coimbatore Long, Pusa Domosami, Priya, Ark Harit, Pusa Vishesh, Mahico Karela, Green Long, Jaipur Local.

Tinda: Bikaner Green, Dil Pasand, Tinda Ludhiana, Tinda Ludhiana (S-48), Arka Tinda, Hissar, Selection-1, Jaipur Local Roandar.

Water melon: Durgapura Madhu, Punjab, Sunahari, Punjab Hybrid, Hara Madhu, Pusa Madhuras.

Musk melon: Sugar Baby, Durgapura Meetha, Durgapura Kesar, Arka Jyoti Sankar, Madhu Sankar.

Chikni Turai: Galgal Turai (Pusa Chikni), Selection-99, Kalyanpur Chikni, Pusa Supriya.

Dharidar Turai: Pusa Nasdar, Kalyanpur Dharidar, Arka Sumit, Arka Sujat.

Uttar Pradesh

Sugarcane: Kosha-8436, Kosha-95255, Kosha-98269 and Kosha-95438.

Punjab

Sugarcane: CoJ-85, CoJ-83, CoJ-64 (early maturing), COH-119, CoJ-88, CoS-8436 for mid season and CoJ-89.

Karnataka

Green gram: Selection-4 and PusaBaisaki.

Cow pea: C-152.

Annexure IV

Contour maps for Relative Humidity, Cloud Amount and Wind speed for the week ending on 13.02.2013

