



# *National Agromet Advisory Service Bulletin*

based on

**Extended Range Weather Forecast  
Valid for 5<sup>th</sup> Septemberto 18<sup>th</sup> September, 2014**

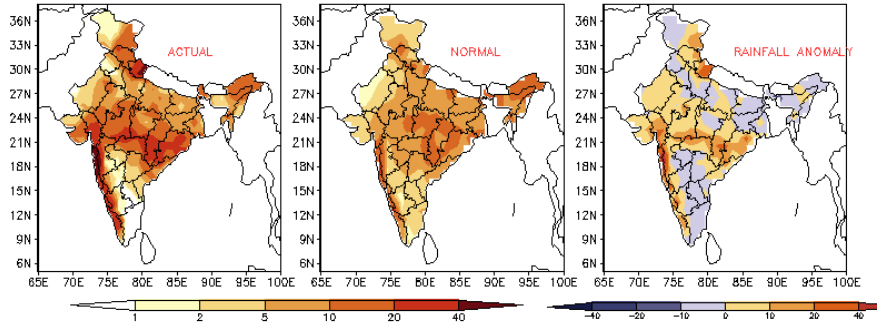
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**Earth System Science Organisation  
Agricultural Meteorology Division  
India Meteorological Department, Pune**

**Indian Institute of Tropical Meteorology, Pune  
&  
Indian Council of Agricultural Research  
AICRPAM, CRIDA, Hyderabad**

## Realized Rainfall (21<sup>st</sup> August to 3<sup>rd</sup> September)



During last two weeks many parts of Konkan & Goa received an average rainfall of more than 40 mm/day. Many parts of Uttarakhand, Odisha, Chhattisgarh, Gujarat region, Coastal Karnataka and Kerala and some parts of Madhya Maharashtra and South Interior Karnataka received an average rainfall of 20-40 mm/day. Many parts of Sikkim, Jammu & Kashmir, Himachal Pradesh, Arunachal Pradesh, West Madhya Pradesh, Saurashtra and Vidarbha and some parts of East Rajasthan, East Madhya Pradesh and Coastal Andhra Pradesh received an average rainfall of 10-20 mm/day. Many parts of Uttar Pradesh, West Bengal, Mizoram, Tripura, Bihar and Jharkhand and some parts of Assam, Punjab and Telangana received an average rainfall of 5-10 mm/day. Many parts of North Interior Karnataka, Marathwada, Kutch region, West Rajasthan, Haryana, Meghalaya, Manipur and Nagaland and some parts of Rayalaseema received an average rainfall of 2-5 mm/day. Mainly dry weather prevailed over rest of the country.

### Monsoon Watch

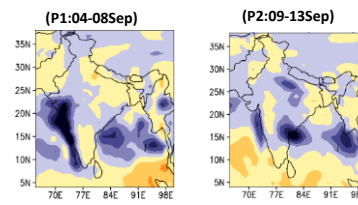
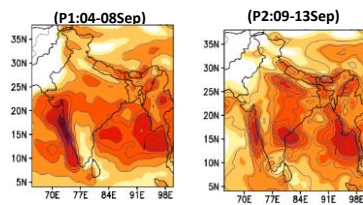
Southwest monsoon was vigorous over Jammu & Kashmir, Punjab, West Rajasthan and Saurashtra & Kutch and active over Haryana, Chandigarh & Delhi, East Rajasthan, Gujarat region, Coastal Karnataka and Kerala on 4<sup>th</sup> September.

### Extended Forecast System (based on CFS model)

#### Rainfall forecast for 4 pentads

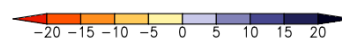
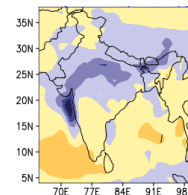
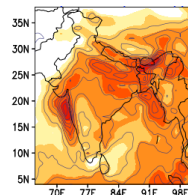
**Rainfall Forecast Actual (mm/day)**

**Rainfall Forecast Anomaly (mm/day)**



(P3:14-18Sep)

(P3:14-18Sep)



P1, P2, P3: PENTADS

**First pentad (04 -08 Sep):** Rainfall of about more than 40 mm/day is likely over Konkan & Goa, Coastal Karnataka, rainfall of about 20-40 mm/day is likely over some parts of Manipur, South Gujarat, South Saurashtra, Madhya Maharashtra and Kerala, rainfall of about 10-20 mm/day is likely over many parts of Sikkim, West Madhya Pradesh, Chhattisgarh, Vidarbha, Odisha, Coastal Andhra Pradesh and Middle Gujarat, some parts of Assam, Nagaland, East Uttar Pradesh and Kutch, rainfall of about 5-10 mm/day is likely over many parts of Uttarakhand, Bihar, Jharkhand, West Bengal, Meghalaya, Tripura, Mizoram, East Madhya Pradesh, East Rajasthan, North Gujarat, Marathwada and Telangana, some parts of North Interior Karnataka, rainfall of about 2-5 mm/day is likely over many parts of Jammu & Kashmir, Himachal Pradesh, Arunachal Pradesh, Punjab, Haryana & Delhi and some parts of West Rajasthan, Rayalaseema and South Interior Karnataka. Mainly dry weather would prevail over rest of the country.

**Second pentad (09 -13 Sep):** Rainfall of about 20-40 mm/day is likely over some parts of East Uttar Pradesh, Coastal Andhra Pradesh and Telangana, rainfall of about 10-20 mm/day is likely over many parts of Uttarakhand, Sikkim, East Madhya Pradesh, Chhattisgarh, Vidarbha, Konkan & Goa, some parts of Sub-Himalayan West Bengal, Meghalaya, Manipur, Nagaland, West Uttar Pradesh and Odisha, rainfall of about 5-10 mm/day is likely over many parts of Arunachal Pradesh, Assam, Mizoram, Tripura, Bihar, Jharkhand, Gangetic West Bengal, West Madhya Pradesh, south Gujarat, Marathwada and Karnataka, some parts of Rayalaseema and Kerala, rainfall of about 2-5 mm/day is likely over many parts of East Rajasthan, Saurashtra & Kutch, Madhya Maharashtra and Tamil Nadu, some parts of Jammu & Kashmir, Himachal Pradesh and Haryana. Mainly dry weather would prevail over rest of the country.

**Third Pentad (14 -18 Sep):** Rainfall of about 20-40 mm/day is likely over some parts of Sub-Himalayan West Bengal and Arunachal Pradesh, rainfall of about 10-20 mm/day is likely over many parts of Sikkim, Manipur, Nagaland, Uttar Pradesh, Bihar, Jharkhand, East Madhya Pradesh, Konkan & Goa, some parts of Assam & Meghalaya, Chhattisgarh, Odisha and Gujarat Region, rainfall of about 5-10 mm/day is likely over many parts of Uttarakhand, Tripura, Mizoram, East Rajasthan, Saurashtra, West Madhya Pradesh, Madhya Maharashtra, Vidarbha, Telangana and Coastal Andhra Pradesh, rainfall of about 2-5 mm/day is likely over many parts of Marathwada, Karnataka, Rayalaseema, Kerala and Tamil Nadu, some parts of Jammu & Kashmir, Himachal Pradesh, Haryana and Kutch. Mainly dry weather would prevail over rest of the country.

### Strategic Agricultural Planning based on rainfall during next 2 weeks till 18<sup>th</sup> September

#### *Current status*

**Southern India:** Monsoon was active over southern states during last week. The *Viruppu* paddy is in milky stage in many of the places of Kerala. Seasonal rainfall over Kerala is normal (9%) so far. The rainfall is normal in North Interior Karnataka (8%) and in Coastal Karnataka (2%) and excess in South Interior Karnataka (23%). Rainfall is deficit in Coastal Andhra Pradesh (-25%) and normal in and Rayalaseema (-14%). The total area sown in the state of Andhra Pradesh is 30.34 lakh ha, which accounts for 73% of the normal *kharif* season area. Telangana state also faces deficit rainfall (-37%). The total area sown in the state of Telangana is 35.63 lakh ha, which accounts for 88% of the normal *kharif* season area. With the receipt of good rainfall during last week, all rainfed crops are recovering

from moisture stress in Andhra Pradesh and Telangana.

**Western India:** Continuous rainfall during last week reduced deficit at Marathwada (-37%). Madhya Maharashtra and Konkan regions received normal rainfall (-1% and -7% respectively). In Gujarat, rainfall status is normal over Saurashtra and Kutch region (-4%) and deficit over other regions of the state (-25%). Sowing of cereals, pulses and oil seeds are nearly 85, 74, 86% of normal *kharif* sowing area. State as a whole 95% area is covered under various crops.

**Central India:** Rainfall status of Vidarbha is deficit (-20%). Rainfall status is normal in West Madhya Pradesh (-14%), but it is deficit over East Madhya Pradesh (-26%).

**Northwest India:** The rainfall status is normal in both eastern (-2%) and western Rajasthan (-6%). Scanty rainfall conditions continues over Haryana, Chandigarh and Delhi (-63%); whereas the situation has improved in Punjab (-59%). Deficit rainfall condition exist over Himachal Pradesh (-35%), East UP (-41%) and West UP (-57%).

**East & Northeast India:** Odisha has experienced normal (10%) rainfall so far during the season. Normal rainfall conditions prevail over Jharkhand (-11%), Sub-Himalayan West Bengal (-9%) and Gangetic West Bengal (-10%). Rainfall status is normal in Bihar (-16%) and Assam & Meghalaya (-18%). Nagaland, Manipur, Mizoram and Tripura are facing deficit rainfall condition (-30%).

### *Future Strategies*

#### **Southern India**

##### **Andhra Pradesh**

- In Coastal AP, sowing of direct seeded rice and chillies may be continued. Undertake gap filling in direct seeded rice. Maintain 2-3 cm water level in rice fields. Apply biogyme, micronutrients and mineral mixture in cotton to overcome slow growth due to micro nutrient deficiencies.
- In Cuddapah district (deficit -35%), sowing of contingency crops like red gram (60 x 20 cm spacing), maize, tomato, cowpea, field bean (TFB 5) and sunflower in red soils and crops like red gram, sorghum and sunflower in black soils instead of groundnut may be completed utilizing the realised and expected rainfall. Undertake soil mulching, weeding and apply protective irrigation.
- In Rayalaseema, intercultural operations and weeding in standing crops may be carried out on a non-rainy day to conserve soil moisture.
- Plan for *rabi* crops like sorghum, safflower, sunflower and green gram.

##### **Telangana**

- As there is improvement in rainfall activity which is likely to continue, sowing of cotton, maize, groundnut, pulses and castor is expected to be completed in Southern Telangana utilising realised and expected rainfall.
- Nursery sowing of tomato, brinjal and chillies is recommended.

- Farmers can go for application of 30-35 kg urea and 10 kg muriate of Potash per acre at 20, 40 and 60 days after sowing as top dressing in cotton.

However, in view of deficit rainfall situation in Telangana, following measures are suggested.

- Foliar spray of 2% KNO<sub>3</sub> or 2% urea solution to supplement nutrition during dry spells.
- Supplementary irrigation by using micro-irrigation (sprinklers).
- Frequent intercultivation to create soil mulch for moisture conservation.

Due to severe moisture stress, maize crop was damaged in Medak, Karimnagar and Mehbubnagar districts of Telangana; maize may be harvested for fodder purpose.

### **Karnataka**

There is improvement in rainfall activity over Interior Karnataka.

- In North Interior Karnataka, sowing of sunflower and fodder crops to avoid fodder shortage is expected to be completed. Land preparation for *rabi* sowings may be undertaken.
- In South Interior Karnataka inter cultivation and weeding operations in red gram, ragi and thinning, gap filling in ragi may be carried out. Continue planting of coconut, sapota, guava and mango.
- Priority should be given to seed cum fodder crops like cow pea, horse gram and moth bean in dry zones so as to avoid scarcity of fodder for livestock.
- Soil moisture conservation techniques such as compartment bunding, ridges and furrows across the slope are suggested for medium and deep black soils spared for *rabi* sowings.
- Plan for early *rabi* crops like sunflower, horse gram (PHG-9), sesame and cowpea.

### **Tamil Nadu**

- Sowing of *samba* rice may be continued in the Cauvery Delta Zone of Tamil Nadu.
- Sowing of maize under rainfed condition and winter irrigated cotton in Western Zone and cultivation of sorghum may be continued.
- Undertake dry land cultivation by selecting drought resistant varieties of cotton KC3, PA255; maize CoH(M) 6; sorghum K8, K11; green gram CO6; sunflower CO4 and pearl millet CO(Cu) 9 to be sown in the Northeast Monsoon season in the South Zone of Tamil Nadu.
- Due to continuous rainfall, germination of winter irrigated cotton is affected in the Western Zone of Tamil Nadu. If more than 80% of the population is affected, go in for re-sowing at optimum soil moisture and if around 20% of the germination is affected, go for gap filling. If stunted growth with 100% population is noticed, spray urea 0.5% under enough soil moisture condition. Provide drainage in rice nursery within 48 hours of sowing facilitate germination.

### **Western India**

#### **Gujarat**

##### **South and Middle Gujarat region:**

- Transplanting of tobacco cv. GT-4, 5,9 and GT-1 should be started under tobacco growing districts of Kheda, Anand, Vadodara and part of Mahisagar district.
- Drain out excess water under earlier planting of tobacco.
- Sowing operation should be started for castor cv. GCH-2, 4, 5 and 7.

### **North Gujarat Region:**

- Start sowing of cluster bean Guj. 1 and 2.
- Sowing operation should be started for castor cv. GCH-2, 4, 5 and 7.

### **Saurashtra region:**

- Start sowing of cluster bean Guj. 1 and 2.
- Sowing operation should be started of castor cv. GCH-2, 4, 5 and 7.
- Guar cv. Guj. Gaur 1 and 2 are specially preferred for Kutch region
- Sowing of Sesame cv. Purva-1 may be done on lands which are not sown so far.

### **Marathwada**

The rainfall is deficit over Marathwada (-37%).

- As rain occurred during last fortnight and also there is probability of occurrence of rainfall in next fortnight, in unsown areas, sowing of contingency crops like sesame, sunflower and pigeon pea is expected to be completed. Undertake *in situ* rain harvesting methods by making furrows in cotton, soybean and sorghum fields.
- Farmers may undertake intercultural operations like weeding / hoeing in late sown cotton, soybean, pearl millet, sunflower and pigeon pea crops during third week of September to conserve soil moisture.

### **Madhya Maharashtra**

- Planting of *adsali* sugarcane may be continued and conserve rain water for future use.
- Maintain the water level of 5 cm in transplanted rice field.
- Sowing of fodder crops like sorghum (Ruchira, Phule Amruta, Phule Godhan) and maize (African tall, Karveer, Rajshree) may be continued utilizing realised and expected rain.
- Plan for early *rabi* sorghum, safflower crops.

### **Central India**

#### **Madhya Pradesh**

- Transplanting of the seedlings of tomato, brinjal and chilli and sowing of other vegetable crops, also seed bed preparation for sowing of *kharif* onion may be undertaken.

Due to heavy rain in Vindhya Plateau Zone of Madhya Pradesh (Bhopal, Damoh, Raisen, Sehore, Vidisha and Sagar districts), if there was complete failure of crops, following advisories are suggested.

- Seed bed preparation for sowing of *kharif* onion.
- Land preparation for sowing of garlic.
- Select short duration potato variety before sowing of wheat (lok-1).
- Sowing of green gram (K-851, Jawahar Mung -721, Pant Mung- 4, T.J. M 3), black gram (Pant U-30, R.B.U.-38, Jawahar Urd-3, J. U-37)) by ridge furrow method is recommended.

## **Chhattisgarh**

- In fallow upland, sowing of horse gram and Niger may be undertaken upto mid September.
- Transplanting of vegetables crops with proper drainage system may be undertaken.
- In view of rainfall received during last week provide proper drainage in oilseed and pulses crops.

## **Vidarbha**

Rainfall condition over Vidarbha region has improved (20% deficit) due to last week's rain. The following advisories are suggested:

- In West Vidarbha, early *rabi* pigeon pea (C-11, ICPL-87119 with closer spacing 45x20 cm) and early *rabi* sesame (N-8) can be sown up to 15 September.
- Maintain water level up to 5 cm in already transplanted rice field in East Vidarbha.

## **Eastern India**

### **Jharkhand**

- In fallow sloppy lands, undertake cultivation of September pigeon pea, kulthi, niger, lobia, rice bean.
- Sowing of horse gram, black gram, niger, kulthi, and sweet potato and transplanting of tomato, cauliflower and cabbage may be continued. Planting of mango, guava and litchi may be continued.
- Prepare land for planting of marigold. After land preparation open the furrow by maintaining a row to row distance of 40 cm and apply half dose of urea @ 50 kg, full dose of single super phosphate @ 94 kg & muriate of potash @ 45 kg per acre and planting may be done with a plant to plant distance of 30 cm.
- Conserve rain water by repairing the broken bunds of the rice field to saturate the soil.
- Undertake sowing of maize in medium land. Select short duration variety like Birsa Vikas Maize-2 (Duration- 70-80 days) and medium duration variety like Birsa Maize-1 (Duration- 80-85days). Undertake sowing of toria (T.-9, B.R.-23 and P.T.-303) in medium land. Undertake sowing of early potato and green pea.

### **West Bengal**

- In view of occurrence of good rainfall during the season and possibility of occurrence of rainfall during next fortnight, it is suggested to postpone irrigation to the standing crops.
- Avoid water stagnation to prevent rhizome rot in turmeric & ginger.
- Sowing of black gram may be continued.
- As there is probability of rainfall, retting of jute may be undertaken by utilising the expected rainfall.
- In *aman rice*, first weeding should be done at 3 weeks after transplanting and second weeding at 6 weeks after transplanting. Apply 4.5 kg Urea / bigha as 1<sup>st</sup> top dressing after 1<sup>st</sup> weeding,

drained out the stagnant water from the field before apply Urea. Keep 5-7cm water at the time of tillering.

### **Bihar**

- In transplanted rice crop, undertake top dressing of 1/3<sup>rd</sup> urea (44 kg/ha) after 1<sup>st</sup> hand weeding at 25-30 days after transplanting and apply remaining 1/3<sup>rd</sup> urea (44 kg/ha) after 2<sup>nd</sup> hand weeding at 40-45 days after transplanting.
- Sowing of pigeon pea (Pusa-9 and Sarad) can be taken up to 15<sup>th</sup> September. Intercropping of black gram/sesame with pigeon pea in 1:1 row ratio is more profitable than sole pigeon pea.
- Before initiation of tassel of *kharif* maize, remove weeds from the field and apply nitrogenous fertilizer.
- Gap filling and eradication of weeds in pigeon pea, black gram and sesame may be continued.
- Sowing of Shakarkand may be undertaken. Rajendra Shakarkand- 5, Rajendra Shakarkand-35, Rajendra Shakarkand-43, Rajendra Shakarkand-47, Kalmegh and Rajendra Shakarkand-92 are recommended varieties for sowing in north Bihar.

### **Odisha**

In the flood affected areas, where there was complete failure of crops in upland and up-medium land, sowing of pre-*rabi* pulses and oil seeds like green gram, black gram, horse gram, sesame, castor and vegetables may be continued.

- *Kharif* rice is at tillering stage (three to six week stage). At three week stage apply urea 25kg in short duration and 35kg urea in medium and long duration paddy. Use neem coated or sulphur coated urea for better performance. Weed out the field before fertilization. The short duration paddy which is at Panicle initiation (PI) stage apply 13kg urea and 10kg MOP.
- Field preparation for sowing of black gram and green gram may be undertaken.
- Sowing of sesamum @ 2-3 kg per acre in upland may be undertaken. The varieties are Nirmala, Prachi and black gram var PU-31, PU19.
- Raising of nursery for rabi vegetables may be undertaken.

### **Northwest India**

#### **Rajasthan**

##### **East Rajasthan**

- Nursery sowing of mid season cauliflower (Pusa Hybrid-2, Improved Japanese, Pusa Shubhra and Pusa Himjyoti) may be continued.
- Sowing of radish (Pusa Chetki) is recommended in Semi Arid Eastern Plains Zone.
- Hoeing & weeding and removal of alternate rows to conserve moisture are suggested.

##### **West Rajasthan**

- In rainfed areas, maintain proper plant population by removing unwanted and diseased plants to conserve moisture.
- Hoeing and weeding operation to reduce weed population and to maintain proper aeration in standing crops is recommended.



- Spray thiourea at 500 ppm or undertake vegetative and dust mulching to conserve soil moisture.
- Conserve soil moisture by Bhakhar and planking to utilize residual soil moisture for *rabi* crops like taramira (RTM 314) and fodder sorghum (Raj Chari 2) and perennial grasses like sewan, dhaman and modadhaman grass etc. which grow naturally during rainy season can also be grown to use as fodder.

## **Uttar Pradesh**

### **East Uttar Pradesh**

Rainfall is deficit by 41% in Eastern UP.

- Undertake top dressing of Nitrogen @ 40 kg per hectare in sunflower in Allhabad, Chitrakut, Fatehpur, Kaushambi and Pratapgarh districts of Central Plain Zone of Uttar Pradesh.
- Nursery sowing/transplanting of cauliflower, cabbage, tomato and chilli in Raibareilly, Sultanpur, Basti, SantKabir Nagar and Gorakhpur districts may be continued.
- Sowing of arhar (Bahar, Narendra Arhar 1, 2, Azad, Pusa-9, Malveey-Vikas, Chamtkar, PDA-11) and moong (Pant-1, Narendra-1, PDM-54, Malyeey- Jyoti, Janchetana, Janpriya, Jagruti, Samrat and Asha) in Barabanki, Faizabad and Ambedkarnagar districts of Eastern Plain Zone of Uttar Pradesh may be completed. Intercropping of moong or lobia with arhar is also advised.
- Sowing of ladies finger and lobia in Gorakhpur, Raibareilly and Sultanpur districts may be undertaken.
- Apply 2% urea in standing crops except pulses in Kannauj, Mathura, Agra, Kanpur districts of Central Plain Zone of Uttar Pradesh.
- Sowing of toria /Agati mustard or potato is recommended in September.
- Conserve moisture for early sowing of *rabi* crops in September.

### **West Uttar Pradesh**

Rainfall is deficit by 57 % in Western UP.

- Sowing of pigeon pea (Bahar, Narendra 1 and 2) + pearl millet (NDFB 3) + blackgram (Ajad) is recommended.
- Weeding in urd, moong, lobia, til, arhar, groundnut, soybean and rice in Bundelkhand zone may be undertaken during third week of September.
- Undertake foliar spray of 1% KCl.
- Opening conservation furrow is recommended.

## **Haryana**

As the rainfall situation is scanty so far, crop diversification is advocated and short duration mung bean (MH 421, SML 668) or maize or fodder crops as per local demand/ market are suggested in place of paddy.

Apply irrigation to bajra and recently transplanted fruit crops (through micro irrigation system). Undertake hoeing in guar and pulses for conserving soil moisture. Alternate wetting and drying in rice fields and irrigation is advised in alternate rows in sugarcane in case of shortage of water for irrigation.

Following measures are also suggested:

- Straw mulching in between rows for soil moisture conservation and preparation of ridge and furrow for rain water harvesting.
- Foliar spray of urea (2.5%) at 30-35 days.
- Conjunctive use of canal and ground water.

Plan for *rabi* sowing of mustard (RH-30, RH -819, RB-24, RB 50, RH- 781 and Varuna) and chickpea (C-235, H-208 and HC-1).

## **Punjab**

Rainfall situation is scanty in the state so far (-59%). As mainly dry weather is likely to prevail over the state, following recommendations are given.

- Sowing of early varieties for potato is recommended.
- Transplant tomato seedlings for autumn-winter crop.
- Complete new plantation of fruit crops.
- Sowing of leguminous and non-leguminous crops in mixture to improve the nutritive value of the fodder i.e. maize + cowpea, sorghum + guara is advised.
- Sowing of short duration early maturing and drought tolerant varieties of crops including maize (PMH1, PMH2) and moong (PAU 911, ML 818).
- Moong variety ML 13 can be sown in rainfed areas in Gurdaspur, Hoshiarpur and Ropar. Moong variety PAU- 911 has been recommended for the whole state except Bathinda, Mansa, Faridkot, Muktsar and Ferozepur districts.
- In Western Plain Zone of Punjab, undertake sowing of short duration hybrid maize (PMH 2).
- In Undulating Plain Zone of Punjab, continue nursery sowing of mid-season cauliflower, desi varieties of radish, carrot and turnip.
- Adopt moisture conservation practices like hoeing, weeding, mulching in crops like sugarcane, maize, cotton to reduce the evapotranspiration losses and to conserve moisture for *rabi* crops.
- De-tasselling in maize is advised to reduce transpiration losses.
- Sowing of toria is recommended.

## **Delhi**

As subdued rainfall activity is prevailing and is likely to continue, application of irrigation to the standing crops is recommended.

- Making of higher bunds for conserving rain water in the field is advised.
- Weeding and hoeing in all crops and vegetables may be carried out for optimum growth.
- Sowing of carrot in the raised bed may be undertaken. Recommended cultivars for carrot are Pusa Rudhira and Pusa Kesar.
- In sugarcane intercultural operations, earthing up and tying operations are recommended.
- Transplanting of brinjal, tomato, chilli, cauliflower and cabbage are advised on raised bed where seedlings are ready.
- Preparation of nurseries on raised bed for mid season cauliflower (Nov.-Dec.) is suggested. Varieties: Pusa sharad, Pusa hybrid-2, Pant shubra.

- Transplanting of onion seedling in the prepared fields may be undertaken.
- Sowing of sarson saag- Pusa saag-1; radish- Versa kee rani, summer long, long chetaki; spinach- All green; coriander- pant Haritama or other hybrids may be undertaken on raised bed.
- Transplanting of Chrysanthemum, marigold and sowing of gladiolus may be undertaken on raised bed.

### **Jammu and Kashmir, Himachal Pradesh and Uttarakhand**

- In Jammu & Kashmir, undertake sowing of toria in fallow lands in Sub Tropical Zone, continue transplanting of cole crops and and sowing of root crops preferably on ridges. Apply second top dressing of nitrogen @ 3.25 kg urea per kanal in rice after 38-42 days of transplanting and second top dressing of nitrogen @ 3.25 kg urea per kanal in maize. Nursery sowing of cabbage (Golden Acre, Pride of India and Pusa Mukta) and cauliflower (Giant Snow Ball and Pusa Synthetic) may be continued. Drain out excess water from fields.
- Nursey sowing of chinese cabbage and direct sowing of raddish, carrot, broccoli, lettuce in mid hill region and transplanting of ageti cauliflower and cabbage may be continued in Chamba, Hamirpur, Kangra, Una and Bilaspur districts of Himachal Pradesh. Weeding in fodder crops like peas, maize in high hills region may be carried out. In Shimla, Sirmaur and Solan districts, sowing of carrot (var. Arkel, VL-7), cauliflower (Patna snowball and Joint snowball), cabbage (Pride of India, Golden anchor) and transplanting of onion may be continued.
- Mulching with straw or lantana, eupatorium leaves and twigs in between rows and removal of lower 5-6 leaves in maize after complete tasselling to reduce transpiration loss is suggested in Sub-Montane and Low Hills Sub-Humid Zone of Himachal Pradesh.
- Nursery beds for winter flowers i.e. Gudashia, marigold, chrysanthemum, antirrhinum and limonium etc. may be prepared and plantation of agro forestry trees which are in polybags like harad, bahera, amla, ritha, jamun and kher may be undertaken in Himachal Pradesh. Plan for normal sowing of *rabi* crops like wheat, barley or mustard.
- In Uttarakhand, maintain 5cm water level in rice crop and apply second dose of Urea. Weeding in standing crops may be carried out. Sowing of vegetable pea varieties like VL Ageti Mater-7, Vivek Mater-10, Pant Subjee Mater-3, Azad Mater-3 and Arkel in high hills are recommended for Nainital district. Sowing of fodder crops like sorghum, maize. lobia etc. may be undertaken in Udham Singh Nagar district. Chara Sarson-602 variety of sarson and African Tall, Jawahar or Kisan variety or any local variety of fodder Maize are recommended. Planting of new orchards is advised.

### **Northeast India**

#### **Arunachal Pradesh, Assam & Meghalaya, NNMT**

In flood affected areas of Lower Bramhaputra Valley Zone of Assam, the following contingency measures may be adopted for *sali* rice:

- Nursery raising of the photo insensitive short duration variety like Luit for replanting (in case of total damage).
- Wet seeding of sprouted seeds (@75-80 kg/ha) of short to medium duration varieties like

Disang, Luit, (100 days) Kapili, Kalong (120 days) is suggested.

- Adoption of submergence tolerant varieties like Jalashree and Jalkuwari for repeat in flood prone areas.
- In partially affected fields, drain out excess water and apply 1/2 N + 50% K<sub>2</sub>O as top dressing during tillering stage.
- Farmers may also opt for sowing of green gram, black gram, soybean etc.

In Upper Bramhaputra Valley Zone and in North Bank Plain Zone of Assam, farmers in the flood affected areas should select short duration HYV rice varieties like Luit, Kapili, Kolong, Dishang etc. These varieties can be transplanted or sown within 1<sup>st</sup> week of September. Long duration cultivars like MonoharSali, AndrewSali and Gitesh can be transplanted with 60 day old seedlings, whereas Prafulla can be transplanted with 90 days old seedlings. Therefore, farmers should be ready with this type of cultivars to cope up with flood situation. Gap filling in the main field should be done with same age of seedling at 20 and 40 days after transplanting.

- In Central Bramhaputra Valley Zone of Assam, continue transplanting of *sali* rice. Continue sowing of black gram, sesame and nursery sowing of cole crops. In Hill zone of Assam, replanting of dead hills or gap filling with seedlings of *sali* rice of similar age should be done within 7-10 days of transplanting.
- In Meghalaya, maintain water level of 3-5 cm in transplanted *Sali* rice. Nursery preparation / sowing of vegetables like cabbage, cauliflower, carrot, radish, laipatta, broccoli and French bean may be continued. Undertake water harvesting structures like construction of Jalkunds, ponds or in-situ moisture conservation through use of farm biomass especially weeds as mulching material for crop cultivation. In ginger and turmeric undertake hand weeding followed by fertilizer application, earthing up and mulching. Apply 81.4 kg/ha urea and 41.75 kg/ha MOP for ginger and apply 65.1 kg/ha urea and 100.2 kg/ha for turmeric MOP at 90 DAS. Mulching can be done with locally available weed biomass, maize stalk, etc.
- In Manipur, in *kharif* rice, maintain water level of 5-8cm. Weeding may be done before top dressing. Apply 33 kg Urea/ha at panicle initiation stage after complete removal of water. Raise off-season tomato nursery under polyhouses. Preparation of nursery for onion may be undertaken. Prepare main field for transplanting raised cole crops nurseries (Cabbage/Cauliflower/Broccoli). Land preparation for sowing of french bean, broad bean and pea may be undertaken. Recommended varieties for French bean are – Pant Anupam, Anupam and Tangkhul Hawaii (local), for broad bean, plant local variety and for pea, Arkel or Azad may be planted.
- In Mizoram, drain out excess water from cucurbit and pineapple fields.
- In Nagaland, provide good drainage in ginger fields to avoid rhizome rot.
- In Mild Tropical Plain Zone of Tripura, provide adequate drainage in groundnut at pod filling stage particularly in low and medium lands and where there is a chance of water stagnation. Weeding may be carried out in *aman* rice.