Directorate of Pulses Development,
Government of India
Ministry of Agriculture & Farmers Welfare
Deptt. Agri., Cooperation & Farmers Welfare
Bhopal -462004

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Sub:-Report on Impact assessment of prevailing high temperature on Wheat crop - Madhya Pradesh State (Ref.: Ministry's e-mail Letter dated 14th January, 2016.)

1 Wheat Crop Scenario

1.1 In Madhya Pradesh the rabi crops are grown in an area of about 85.00 lakh ha. Wheat is a major rabi cereal crop occupying 48% of the total normal area. This year, as per the WWWR (Weekly Weather Watch Report), wheat has been planted in 50.93 lakh ha which is 15% less against the targeted area of 58.70 lakh ha. So far, the rabi crops have been sown in an area of 98.24 lakh hectares.

1.2 Spatial variation, less rainfall, early recession of SW monsoon associated with higher than the desired temperature regime during October onward may be attributed to delayed wheat sowing this year. The rainfed regions usually opt for early sowings of crops including wheat during October on residual moisture. But this year there has been reports of replanting of early sown wheat due to poor or no germination owing to soil moisture stress and higher temperature.

1.3 Major varieties grown in M.P. are - Sujata, C-306, HI-1531 (Harshita), HI1500 (Amar), HI-8627 (Malaw Kirti), GW-366, GW-322, JW-273, HI-1544 (Purna), HI-8498 (Malaw Shakti) HI 8381 (Malaw Shri), HI 8663 (Poshan), MPO 1106 (Sudha), MP 1203, MPO 1215, HD 4672 (Malaw Ratna).

2. Sowing Time

2.1 ***Early sown*** i.e. ***end of Oct. to 10th Nov***. with limited irrigation. During this period the maximum temperature remained high i.e. between 29^0C to 33^0C. The crop sown during this period has faced the seedling mortality, However, plant population was compensated with high seed rate, a traditional practice under rainfed situation. This crop is seen with poor tillering and also forced heading at certain locations. The total area under early sown condition is much less. The vegetative growth is affected resulting short spikes were the yield may adversely affect.

2.2 ***Timely sown*** i.e. ***15th Nov. to 30th Nov. with full irrigation***. The area under this category is more than 50%. The temperature during this period were high i.e. beyond 29^0C at time of sowing. The high seed rate compensated the plant population and tillering. However, the crop is at boot stage in most of the areas.

2.3 ***Late sown*** i.e ***December sowing***. This area comes in the command belt. The farmers have already used at least two irrigation till date which have reduced the soil temperature. However, such temperature regime had been experienced during the previous three years also but the state could harvest a record production. Provided, the decrease in temperature and winter rains, the productivity loss may only be upto 10 %.

3. Recommended/practiced irrigation schedule for wheat crop

S. No.	Physiological Stages	Period (DAS)	Irrigation schedule	Remark
1	Sowing & germination		-	i) Due to deficit rainfall and prevailing soil moisture stress and higher temperature, crop need more frequently irrigation. ii) Early sown wheat observed physiological adjustment even before 10-15 days flowering and milking stage.
2	Crown Root Initiation (CRI)	21	I^{st}	
3	Late Tillering	42	II^{nd}	
4	Late Jointing	60	III^{rd}	
5	Flowering	80	IV^{th}	
6	Milking Stage	95	V^{th}	
7	Dough Stage	115	-	

4. Rainfall & Temperature Status

4.1 ***The total seasonal rainfall*** during the current SW monsoon (14.06.2015 to 30.09.2015) ZDV PP ZKLFK LV OHVV DV DJDLQVW WKH VWDW per the data, 5 districts received. Excess, 23 normal and 23 received deficit rainfall.

4.2 ***The winter rains/showers were received*** in some districts of the state during last week of October, 2015. (28^{th} -29^{th}). Thereafter, the light showers have been experienced after 15^{th} January.

Between Jan. 17^{th} to 19^{th} good winter showers have been received across the state. As on the date of reporting, cloudy weather prevails all across the state. The day & night temperatures have also declined, the standing wheat crop may compensate the losses up to maximum extent with the existing congenial weather.

4.3 The plant physiology of wheat require a temperature regime between 22^0C -28^0C for better growth from vegetative to reproductive/dough stage viz., ***germination 22^0C-23^0C, tillering- 20^0C, heading/flowering-24^0C, Milk stage- 24^0C-25^0C & dough stage/maturity 25^0C-28^0C.***

4.4 As per the Metrological data the temperature during October & November have been between 29^0C to 33^0C. During December also the temperature regime has been higher as against the temperature requirement of 22^0C to 28^0C for better harvest of the wheat crop.

4.5 During 1^{st} fortnight of this January, the temperature has been between 15^0C to 28^0C. The change in weather is being observed from 15^{th} January onward.

5. Reservoir Status