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Crop weather calendar: A crop guide line

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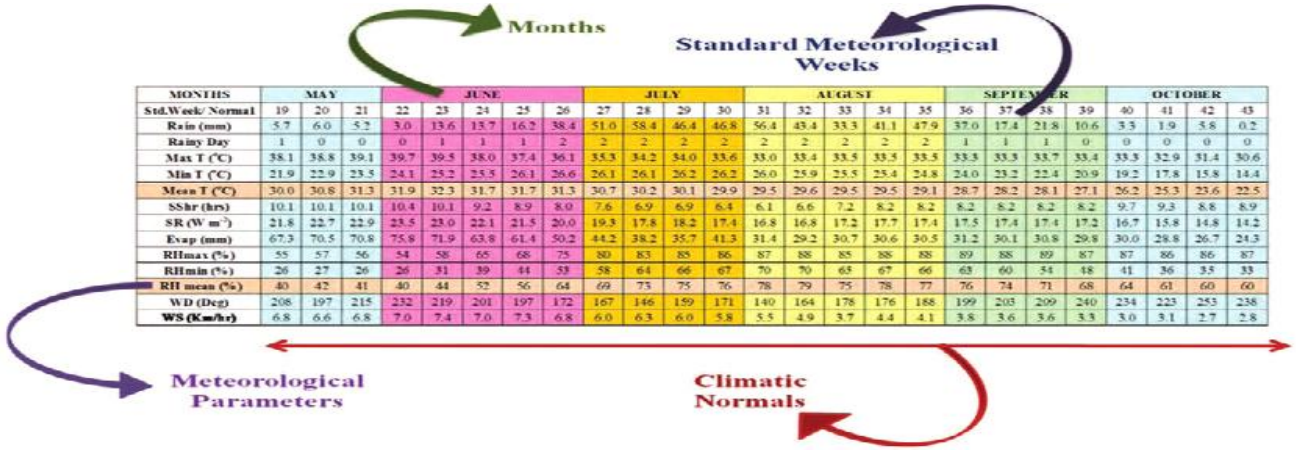
A crop weather calendar contains the summarized information of crops in one single sheet of paper. The crop weather calendars are prepared in different languages for better understanding to farmers and explain the usage/ importance; and plan farm operation and activities by taking decisions as per the prevalent crop weather conditions in fields. It plays a vital role for important crops and various varieties through research and development based process at village/ panchayat level, and also helpful in improving the quality of medium range weather forecast based agro advisory services.



MONTHS	MAY			JUNE					JULY				AUGUST					SEPTEMBER				OCTOBER			
Std.Week/ Normal	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
Rain (mm)	5.7	6.0	5.2	3.0	13.6	13.7	16.2	38.4	51.0	58.4	46.4	46.8	56.4	43.4	33.3	41.1	47.9	37.0	17.4	21.8	10.6	3.3	1.9	5.8	0.2
Rainy Day	1	0	0	0	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	0	0	0	0	0
Max T (°C)	38.1	38.8	39.1	39.7	39.5	38.0	37.4	36.1	35.3	34.2	34.0	33.6	33.0	33.4	33.5	33.5	33.5	33.3	33.3	33.7	33.4	33.3	32.9	31.4	30.6
Min T (°C)	21.9	22.9	23.5	24.1	25.2	25.5	26.1	26.6	26.1	26.1	26.2	26.2	26.0	25.9	25.5	25.4	24.8	24.0	23.2	22.4	20.9	19.2	17.8	15.8	14.4
Mean T (°C)	30.0	30.8	31.3	31.9	32.3	31.7	31.7	31.3	30.7	30.2	30.1	29.9	29.5	29.6	29.5	29.5	29.1	28.7	28.2	28.1	27.1	26.2	25.3	23.6	22.5
SShr (hrs)	10.1	10.1	10.1	10.4	10.1	9.2	8.9	8.0	7.6	6.9	6.9	6.4	6.1	6.6	7.2	8.2	8.2	8.2	8.2	8.2	8.2	9.7	9.3	8.8	8.9
SR (W m^{-2})	21.8	22.7	22.9	23.5	23.0	22.1	21.5	20.0	19.3	17.8	18.2	17.4	16.8	16.8	17.2	17.7	17.4	17.5	17.4	17.4	17.2	16.7	15.8	14.8	14.2
Evap (mm)	67.3	70.5	70.8	75.8	71.9	63.8	61.4	50.2	44.2	38.2	35.7	41.3	31.4	29.2	30.7	30.6	30.5	31.2	30.1	30.8	29.8	30.0	28.8	26.7	24.3
RHmax (%)	55	57	56	54	58	65	68	75	80	83	85	86	87	88	85	88	88	89	88	89	87	87	86	86	87
RHmin (%)	26	27	26	26	31	39	44	53	58	64	66	67	70	70	65	67	66	63	60	54	48	41	36	35	33
RH mean (%)	40	42	41	40	44	52	56	64	69	75	75	76	78	79	75	78	77	76	74	71	68	64	61	60	60
WD (Deg)	208	197	215	232	219	201	197	172	167	146	159	171	140	164	178	176	188	199	203	209	240	234	223	253	238
WS (Km/hr)	6.8	6.6	6.8	7.0	7.4	7.0	7.3	6.8	6.0	6.3	6.0	5.8	5.5	4.9	3.7	4.4	4.1	3.8	3.6	3.6	3.3	3.0	3.1	2.7	2.8

Definition : Detailed information for each important crop on their dates of sowing dates of commencement and duration of major cultural operations, important periods in their life cycle and their most probable weather requirements have in India been presented in a pictorial form called the Crop Weather Calendar (Varshneya and Pillai, 2008).

Parts of crop weather calendars: The crop weather calendars consist of three parts. At the bottom is the typical life history of the crop, from the sowing window to the period of maturity, in the form of a diagram. Important "phases" like sowing, germination and seedling, transplanting (in the case of rice), vegetative growth, flowering, grain formation and maturity may be indicated. These "phases" cover certain time intervals indicated by horizontal arrows, which depend on variations in (a) crop variety, (b) sowing date from place to place and from year to year, and (c) the nature of the crop itself. For ready reference, the months and standard weeks are marked at the bottom of the diagram.

The middle of the calendar shows the weekly normal weather as far as such conditions could be determined from long term averages. Normal phase wise water requirements of the crop are also indicated here, determined from potential (or reference crop) evaporation multiplied by appropriate crop co-efficients, together with the total water requirements over the season.

The uppermost portion of the calendar indicates the weather conditions favourable for incidence of pests and diseases and the nature of the weather warnings that can be given. Three crop development stages are represented during which these warnings for the respective weather conditions, pest and diseases are to be issued by the forecasting office concerned. It is obvious that diagrams such as these help the weather forecaster to see, at a glance, what warnings are to be issued for a particular district during a given weather situation during a particular phase of a crop. With proper guidance as services provided by agricultural meteorologists, these calendars will also be of much interest to the agricultural profession and to the various Government Departments concerned with Agriculture and Food Production, as well as educationally

to the general public. The calendars are being subjected to periodical checking and revision (*http://www.agrometeorology.org*).

Why it is importance? In order to provide the farmer with an efficient weather service, it is essential that the weather forecaster should be familiar with the crops that are grown in a particular agro-climatic zone. The type of forewarning to be given depending upon the state and stages of the crop are also to be known. In case of farmers, they should become familiar with weather bulletins and learn how to interpret them. To meet the above requirement, the detailed information collected from the agricultural departments has been condensed by the IMD and presented in a pictorial form known as crop weather calendar.

The crop weather calendar consists of three parts *viz.*, crop husbandry, normal weather requirement and weather warning. The important crop phases like sowing, germination, transplantation (in case of rice), tillering, elongation, flowering, grain formation and harvest are indicated under the husbandry against the standard agro-meteorological weeks in lower part of calendar. The normal monthly rainfall and number of rainy days are depicted in middle of the calendar with weather requirement and upper most portion of the calendar indicates the nature of the weather warnings to be issued in different crop periods. These crop weather calendars help the weather forecaster to see at a glance the type of weather warnings are to be issued for a particular district in a given weather situation during a particular phase of crop. They are of equal interest to the farmers for better crop management. However, they failed to produce the desired results since they are not used as handy tool in practice and become obsolete with fast changing crop verities. Also, the crop weather calendars prepared on district wise may not be of much use at micro level. Hence, the crop weather calendars are to be prepared at the village level by the agro-meteorological field units (AMFUs), established for agro-advisory, through research and development for major crops and for varieties, if possible, they help in improving quality of agro-advisory based on medium range forecasting.

Crop weather calendar as tool in agro advisories: Earlier scientists used to refer to books for extracting the information on a crop, as on an average a crop takes 90-130 days to mature. On the other hand, crop weather calender contains the summarized information with respect to crop - weather - pest / disease in one single sheet of paper. The work of an extension worker is directly linked with preparing / disseminating an agromet advisory for his region. This single sheet of paper if used judiciously will help him preparing not only a value based advisory with all the relevant messages with respect to weather - crop - pest / disease but also save his valuable time. Moreover, crop weather calendar can be prepared for different districts as well as for the major crops of the state.

Today's farmer is an educated person whose livelihood is dependent on the success and failure of his crop. Also the information technology era has sensitized the farmers about the importance of weather in crop growth. A crop weather calendar contains the summarized information of 90-130 days of crop in one single sheet of paper. If crop weather calendars are prepared in local language and distributed to the farmers and he is explained the usage/ importance of the crop weather calendar, then he can plan his farm operation by taking decisions as per the prevalent crop weather pest conditions in his field. If the farmers realize the importance of that single sheet of paper he will readily adopt it and take full advantage of the information contained in that Calendar. It plays a vital role for important crops and various varieties through research and development based process at village/ panchayat level, and also helpful in improving the quality of medium range weather forecast based agro advisory services (Kaur *et al*., 2013).

These calendars are useful for crop planning, irrigation scheduling and plant protection measures, which are of vital importance for effective crop planning and for maximizing and stabilizing food production in the country. In a broader perspective over a period of say five years, the concise information contained in these calendars give broad indications of the direction of development which may prove useful to the planners, agricultural administrators, plant breeders and the farmers in formulating policy matters regarding plant breeding, crop adaptation, drought proofing, supplemental irrigation, maximizing the yield etc.

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