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# Letters to the Editor

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## ONSET OF SOWING MONSOON RAINS OVER TELANGANA, MARATHWADA AND RAYALASEEMA USING SHORT PERIOD PROBABILITY RAINFALL ANALYSIS

1. Farmers' cropping strategies during onset of rainy season are influenced by the rainfall variability. For tropical regions Morris and Zandstra (1978) chose 75 mm accumulated rainfall as the onset time for the growing season for dry crops and 200 mm accumulated rainfall for initiation and pudling-wet land preparation of rice fields. Raman (1974) set the criterion for identification of commencement of sowing rains as 'a spell of at least 25 mm of rain in a period of 7 days'. In a pilot study it was found by him that this criterion was satisfied on more than 75 % of occasions and actual rainfall exceeded 50 mm. Keeping these limits in view and different farming practices in India, probabilities of getting cumulative rainfall of 50 mm, 75 mm, 100 mm, 150 mm and 200 mm at probability levels of 30 %, 50 % & 80 % have been calculated as was done by Morris and Zandstra. These values are presented in Table 1.

2. For dry land farming operations the criterion of onset of sowing monsoon rains may be taken to that week for which the probability of getting 50 mm of cumulative rainfall is at least 30 %. For wet land farming operations the criterion of onset of sowing monsoon rains may be taken to that week for which the probability of getting 100 mm of cumulative rainfall is at least 30 %.

3. In order to cover three sunspot cycles and also to fulfil the climatological data requirement, 34 years of continuous data (1947-1980) have been used in respect of Hyderabad, Nizamabad, Cuddapah, Kurnool, Nellore, Machilipatnam, Kakinada, Aurangabad, Ahmednagar, Raichur, Bellary, Pune, Bombay, Mangalore and for Khammam (1901-1934). In case of Nanded 33 years, (1947-1979), Osmanabad 29 years, (1947-1976) and Anantapur 25 years, (1947-1971) available continuous data have been used. The monsoon weeks are counted from the calendar month of 1 June to 30 September. With a view to cover entire monsoon season the 17th week is taken as 10 days (21-30 September). Nizamabad, Hyderabad, Mahabubnagar, Khammam are the representative stations of Telangana, Aurangabad, Nanded, Osmanabad for Marathwada, Anantapur, Cuddapah, Kurnool for Rayalaseema, Bidar, Bijapur, Raichur, Bellary for north interior Karnataka, Mangalore and Bombay for west coast, Kakinada, Machilipatnam, Nellore for east coast. Ahmednagar, Pune represent inland neighbouring stations for comparison.

4. Table 2 gives the modal weeks (*i.e.*, weeks which have maximum frequency of occurrence) together with probability of occurrence of specified amounts of cumulative rainfall. The Onset of Sowing Monsoon Rains (OSMR) on west coast is rapid, slow over Rayalaseema, while at other stations in the present study except Nellore the OSMR is gradual.

### 4.1. *Telangana*

In Telangana the probability of getting 50 mm of Cumulative Rainfall (CR) is 30 to 50 % in the third week. The modal week for getting the same amount of rainfall is fourth week with probability 60 %. Therefore, dry crops third week may be taken as the Onset of Sowing for Monsoon Rainfall Week (OSMRW). The probability of getting 100 mm of CR is about 40 % in the fourth week and the modal week for getting the same amount of rainfall is also fourth week. Fourth week may, therefore, be taken as the OSMRW. At 80 % probability level the period for getting CR of 50 mm to 100 mm is 5th to 8th week and 100 mm to 150 mm is 6th to 9th week. It means that subsequent to OSMR 5 to 6 weeks will have assured rainfall for other agricultural operations.

### 4.2. *Marathwada*

In Marathwada the probability of getting 50 mm of CR is about 30 % in the second week and 75 mm of CR is about 35 % in the third week. The modal week for getting 50 mm of CR is third week. Therefore for dry crops third week may be taken as the OSMRW. The probability of getting 100 mm of CR is about 35 % to 50 % in the fourth week. The modal week for getting the same amount of rain is also fourth week. Consequently, fourth week may be taken as the OSMRW for wet land agriculture. At 80 % probability level the period for getting CR of 50 mm to 100 mm is 4th to 6th week and 100 mm to 150 mm is 6th to 8th week. This indicates that subsequent to OSMR there will be assured rainfall for 4 to 5 weeks for other agricultural operations.

### 4.3. *Rayalaseema*

In Rayalaseema the probability of getting 50 mm of CR is about 35 % in the third week. The modal week for getting the same amount of rainfall varies from 3rd

**TABLE 1**

**Monsoon weeks with cumulative rainfall 50, 75, 100, 150 & 200 mm at probability levels 30%(I), 50%(II), & 80%(III)**

| Station | Rainfall amounts | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 50 mm | | | 75 mm | | | 100 mm | | | 150 mm | | | 200 mm | | |
| | P.L. I | P.L. II | P.L. III | P.L. I | P.L. II | P.L. III | P.L. I | P.L. II | P.L. III | P.L. I | P.L. II | P.L. III | P.L. I | P.L. II | P.L. III |
| Hyderabad | 3 | 4 | 5 | 4 | 5 | 6 | 5 | 6 | 8 | 6 | 7 | 9 | 8 | 9 | 10 |
| Nizamabad | 3 | 4 | 5 | 4 | 4 | 6 | 4 | 5 | 6 | 5 | 6 | 7 | 5 | 7 | 8 |
| Khammam | 3 | 4 | 5 | 4 | 4 | 5 | 4 | 5 | 6 | 5 | 6 | 7 | 6 | 6 | 8 |
| Mahabubnagar | 3 | 4 | 5 | 3 | 4 | 5 | 4 | 5 | 6 | 5 | 6 | 8 | 6 | 7 | 9 |
| Cuddapah | 3 | 5 | 7 | 4 | 6 | 9 | 5 | 7 | 9 | 7 | 8 | 11 | — | — | — |
| Kurnool | 3 | 4 | 5 | 4 | 5 | 7 | 5 | 6 | 8 | 7 | 8 | 10 | — | — | — |
| Anantapur | 3 | 5 | 9 | 6 | 8 | 11 | 7 | 9 | 13 | 11 | 13 | 16 | — | — | — |
| Nellore | 5 | 6 | 9 | 6 | 8 | 10 | 7 | 9 | 12 | 10 | 11 | 14 | — | — | — |
| Kakinada | 3 | 4 | 5 | 4 | 5 | 6 | 4 | 5 | 6 | 5 | 6 | 8 | 6 | 7 | 9 |
| Machilipatnam | 3 | 4 | 5 | 4 | 4 | 6 | 4 | 5 | 7 | 6 | 6 | 9 | 7 | 8 | 10 |
| Raichur | 3 | 4 | 6 | 4 | 5 | 7 | 5 | 6 | 8 | 6 | 8 | 9 | 8 | 9 | 11 |
| Bellary | 4 | 5 | 9 | 5 | 8 | 11 | 8 | 11 | 15 | 18 | 13 | 17 | — | — | — |
| Bijapur | 3 | 4 | 7 | 4 | 5 | 8 | 5 | 7 | 10 | 8 | 10 | 13 | 10 | 12 | 15 |
| Bidar | 2 | 3 | 4 | 3 | 4 | 5 | 4 | 4 | 6 | 4 | 5 | 7 | 6 | 7 | 9 |
| Ahmednagar | 2 | 3 | 5 | 4 | 5 | 6 | 5 | 5 | 8 | 6 | 8 | 12 | 9 | 10 | 14 |
| Aurangabad | 3 | 3 | 5 | 3 | 4 | 5 | 4 | 5 | 6 | 5 | 7 | 8 | 6 | 8 | 9 |
| Nanded | 3 | 4 | 5 | 4 | 4 | 5 | 4 | 5 | 6 | 4 | 5 | 7 | 6 | 6 | 8 |
| Osmanabad | 2 | 3 | 4 | 3 | 4 | 5 | 4 | 4 | 6 | 5 | 6 | 8 | — | — | — |
| Pune | | | | 4 | 5 | 7 | | | | 5 | 6 | 8 | 6 | 8 | 10 |
| Mangalore | | | | | | | | | | 2 | | | 2 | | |
| Bombay | | | | | | | | | | 3 | | | 3 | | |

P.L.—Probability level.

**TABLE 2**

**Modal weeks for getting cumulative rainfall of 50, 75 , 100, 150 & 200 mm and their probabilities**

| Station | 50 mm | | 75 mm | | 100 mm | | 150 mm | | 200 mm | | Monsoon week No. | Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Modal week | Prob | Modal week | Prob | Modal week | Prob | Modal week | Prob | Modal week | Prob | | |
| Hyderabad | 4 | 63 | 4 | 43 | 4 | 21 | 5 | 17 | 8 | 49 | 1 | 1-7 Jun |
| Nizamabad | 4 | 63 | 4 | 53 | 4 | 44 | 4 | 24 | 5 | 31 | 2 | 8-14 Jun |
| Khammam | 2 | 27 | 4 | 56 | 4 | 43 | 5 | 49 | 11 | 51 | 3 | 15-21 Jun |
| Mahabubnagar | 4 | 72 | 4 | 58 | 4 | 40 | 3 | 33 | 7 | 53 | 4 | 22-28 Jun |
| Cuddapah | 5 | 67 | 8 | 79 | 8 | 66 | 6 | 20 | | | 5 | 29 Jun-5 Jul |
| Kurnool | 3 | 44 | 3 | 29 | 5 | 41 | 7 | 43 | | | 6 | 6-12 Jul |
| Anantapur | 7 | 60 | 8 | 54 | 7 | 33 | 12 | 40 | | | 7 | 13-19 Jul |
| Nellore | 6 | 50 | 8 | 61 | 7 | 33 | 11 | 51 | | | 8 | 20-26 Jul |
| Kakinada | 3 | 41 | 4 | 47 | 5 | 56 | 7 | 74 | 5 | 20 | 9 | 27 Jul-2 Aug |
| Machilipatnam | 3 | 43 | 4 | 51 | 4 | 31 | 5 | 30 | 8 | 64 | 10 | 3-9 Aug |
| Raichur | 3 | 37 | 4 | 39 | 6 | 63 | 8 | 69 | 8 | 36 | 11 | 10-16 Aug |
| Bellary | 4 | 41 | 10 | 69 | 8 | 36 | 12 | 44 | | | 12 | 17-23 Aug |
| Bijapur | 4 | 60 | 4 | 40 | 7 | 54 | 8 | 33 | 11 | 43 | 13 | 24-30 Aug |
| Bidar | 4 | 56 | 3 | 37 | 4 | 53 | 5 | 52 | 6 | 49 | 14 | 31 Aug-6 Sep |
| Ahmednagar | 3 | 56 | 4 | 47 | 4 | 30 | 5 | 20 | 9 | 41 | 15 | 7-13 Sep |
| Aurangabad | 3 | 53 | 4 | 66 | 5 | 73 | 7 | 66 | 8 | 64 | 16 | 14-20 Sep |
| Nanded | 3 | 38 | 4 | 60 | 4 | 47 | 5 | 53 | 6 | 51 | 17 | 21-30 Sep |
| Osmanabad | 1 | 17 | 3 | 42 | 4 | 53 | 4 | 31 | | | | |
| Pune | | | 5 | 57 | | | 6 | 54 | 6 | 33 | | |
| Mangalore | | | | | | | 1 | 24 | 2 | 54 | | |
| Bombay | | | | | | | 3 | 54 | 3 | 44 | | |

to 7th week with probability 45 % to 65 %. Therefore, for dry land agriculture 3rd week may be taken as the OSMRW. This is further supported by the assured rain. The probability of getting 100 mm of CR is about 30 % in the 5th week, but the modal week for getting the same amount of rainfall is 7th to 8th week. Further, at 80 % probability level the period for getting CR 50 mm to 100 mm is 9th to 13th week and 100 mm to 150 mm is 13th to 17th week. This shows that wet land agricultural operations are not possible till middle of July. Since the subsequent seasonal supply of rainfall for wet land agriculture is low, wet land agriculture has to be taken up only where irrigation facilities are available, particularly in Anantapur district.

4.4. *North interior Karnataka*

In north interior Karnataka, the probability of getting CR of 50 mm is about 40% in the third week and the modal week for getting the same amount of rainfall is 3rd/4th week. For dry agriculture 3rd week may be taken as the OSMRW. Regarding wet crop operations care has to be taken for dependable rainfall for subsequent weeks particulary in Bellary district. Wet crops seem to be possible in Bidar and Raichur districts but difficult in Bellary district.

**References**

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