

## VARIATION OF MOISTURE UNDER BARE SOIL CONDITIONS

Information on soil moisture in different layers for agricultural planning and management, undoubtedly is a most important feature. Ramdas and Mallik (1942) studied soil moisture variation in surface layer of a few stations. Biswas (1978) tried to find out soil moisture fluctuation in relation to rainfall variations at Pune and Delhi.

2. Soil moisture data on bare soils are available at Solapur and Surat for about ten years. These data are recorded once in a week at four depth, *i.e.*, 7.5, 15, 30 and 45 cm at Solapur and fortnightly at 15, 30, 45 and 60 cm at Surat. Using these, variation of soil moisture at various layers at Solapur and Surat have been studied. Soils around Solapur are heavy, called black cotton soil, containing high percentage of clay. Field capacity and wilting point vary from 41 to 45 and 21 to 24 per cent of dry soil respectively. Soils at Surat are generally calcareous and depths vary from medium to deep. Field capacity and wilting point range from 26 to 33 and 13 to 15 per cent respectively.

3. Table 1 gives the coefficient of variation (CV) (numerator) and amplitude of soil moisture (denominator) for Solapur. CV values are the highest (0.58-0.05) in the first layer when moisture contents are relatively low. These values are somewhat lower

in the monsoon season when moisture contents are rather high. The coefficient of variation decreases sharply with increasing depth and it is in the range of (0.26-0.36) at 45 cm in monsoon season. Thus quick moisture variation normally takes place within 30 cm and it is rapid after monsoon season probably due to formation of cracks which result in quick evaporation of moisture.

Table 2 gives the coefficient of variation at Surat. The highest coefficient (0.46-0.62) is observed in the uppermost layer, these steadily decrease with depth leading to (0.22-0.34) at 60 cm. In temporal variation coefficient of variation decreases gradually upto October in all the layers except first one and then steadily decreases. Unlike at Solapur coefficient does not sharply increase after cessation of monsoon at Surat.

4. Considerably variation of soil moisture at different layers upto 30 cm is observed *in situ* and the variation is quite different in various seasons. The year to year soil moisture content and water storage below 30 cm is not very significant during last week of September and first week of October at Solapur and throughout September and October at Surat. These periods may be selected for practical purposes such as water balance computation.

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TABLE 1  
Coefficient of variation (CV) of soil moisture  
Solapur

Soil depth (cm)	Weeks											
	3rd	7th	11th	15th	20th	24th	31st	35th	37th	43rd	45th	50th
7.5	0.53	0.65	0.61	0.58	—	0.45	0.34	0.34	0.36	0.51	0.58	0.60
	28-14	28-9	29-7	21-7		31-9	35-23	38-27	43-19	41-23	36-28	31-10
15	0.53	0.63	0.65	0.53	0.94	0.52	0.35	0.31	0.30	0.42	0.48	0.47
	29-70	31-12	27-9	28-9	26-7	31-15	34-29	37-27	43-27	41-30	38-28	37-25
30	0.37	0.54	0.53	0.60	0.54	0.50	0.30	0.33	0.33	0.29	0.36	0.41
	35-27	31-19	26-15	27-11	25-12	35-11	37-32	38-24	45-25	41-32	36-30	38-26
	0.39	0.44	0.50	0.52	0.52	0.36	0.34	0.31	0.26	0.30	0.46	0.35
	37-27	33-22	31-15	29-18	28-17	35-16	42-24	42-28	45-28	40-30	38-26	35-24

TABLE 2  
Surat

Soil depth (cm)	Weeks											
	3rd	7th	11th	16th	20th	24th	30th	34th	38th	42nd	48th	50th
15	0.53	0.56	0.62	0.46	0.51	0.59	0.31	0.26	0.32	0.43	0.43	0.35
	21-10	22-9	21-8	16-9	15-7	22-7	33-21	28-18	26-20	29-18	28-18	25-16
30	0.50	0.52	0.53	0.40	0.48	0.44	0.23	0.22	0.43	0.42	0.42	0.52
	28-15	29-16	27-20	22-13	24-14	22-13	28-20	28-20	27-19	31-19	30-19	29-18
45	0.60	0.49	0.40	0.47	0.44	0.36	0.24	0.31	0.34	0.43	0.53	0.49
	29-16	30-20	30-19	26-15	26-16	24-19	29-22	32-21	26-20	30-19	32-19	31-18
60	0.47	0.44	0.52	0.42	0.35	0.34	0.27	0.22	0.36	0.37	0.40	0.48
	29-16	29-19	31-19	29-16	25-17	26-19	27-19	31-21	27-20	30-19	32-19	31-19

## References

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