

# Annual and Seasonal Rainfall Variability at Main Agricultural Research Station, UAS, Dharwad, Karnataka



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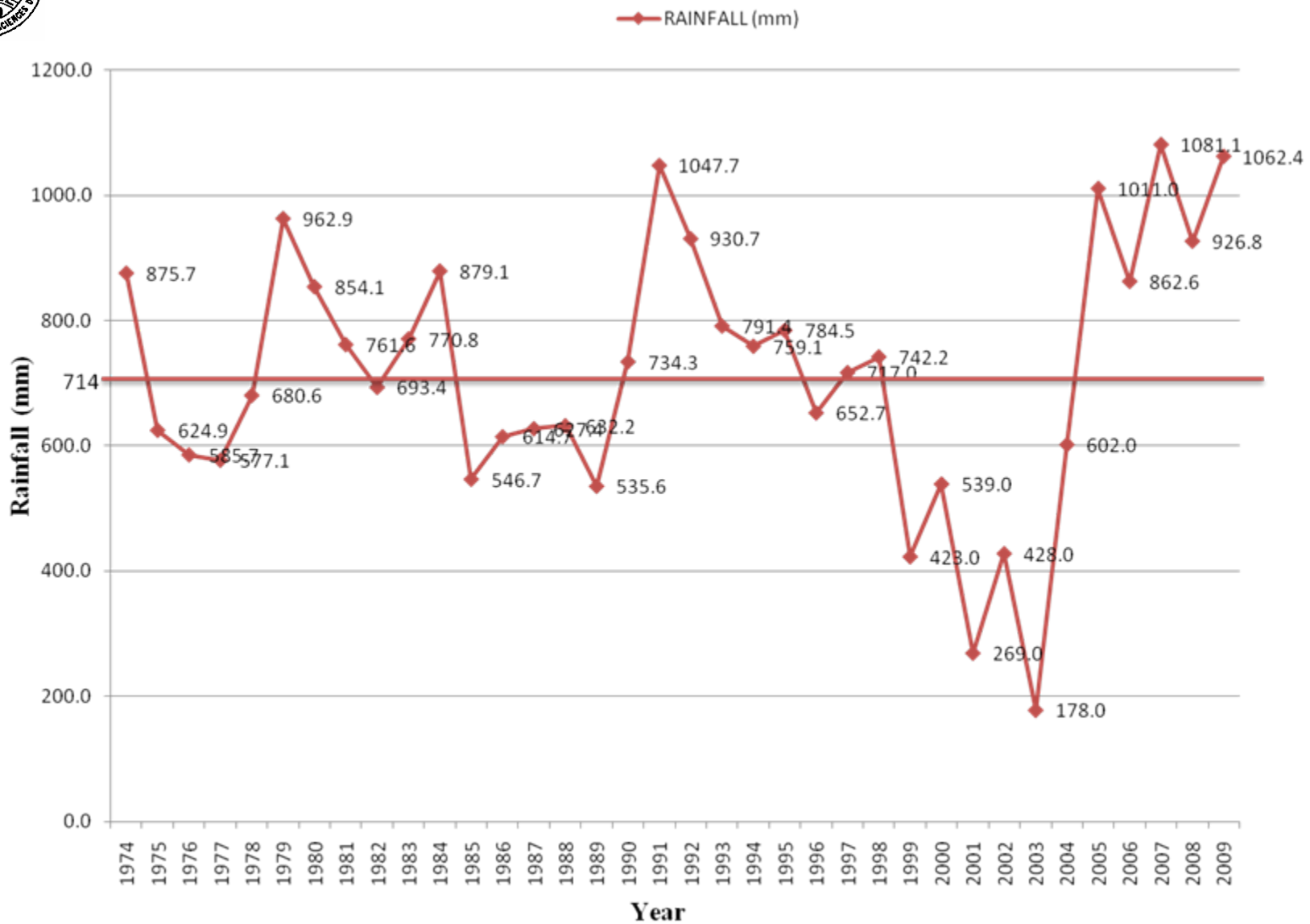
# Annual rainfall (mm) from 1974 - 2009 (36 years) at MARS, Dharwad (Karnataka)

YEARS	RAINFALL (mm)	D from N	YEARS	RAINFALL (mm)	D from N	YEARS	RAINFALL (mm)	D from N
1974	875.7	22.6*	1986	614.7	-13.9	1998	742.2	3.9
1975	624.9	-12.5	1987	627.4	-12.1	1999	423	-40.8
1976	585.7	-18.0	1988	632.2	-11.5	2000	539	-24.5
1977	577.1	-19.2	1989	535.6	-25.0	2001	269	-62.3
1978	680.6	-4.7	1990	734.3	2.8	2002	428	-40.1
1979	962.9	34.9*	1991	1047.7	46.7*	2003	178	-75.1
1980	854.1	19.6	1992	930.7	30.4*	2004	602	-15.7
1981	761.6	6.7	1993	791.4	10.8	2005	1011	41.6
1982	693.4	-2.9	1994	759.1	6.3	2006	862.6	20.8
1983	770.8	8.0	1995	784.5	9.9	2007	1081.1	51.4
1984	879.1	23.1*	1996	652.7	-8.6	2008	926.8	29.8
1985	546.7	-23.4	1997	717.0	0.4	2009	1062.4	48.8

Mean = 714 mm

D = Deviation

N=Normal



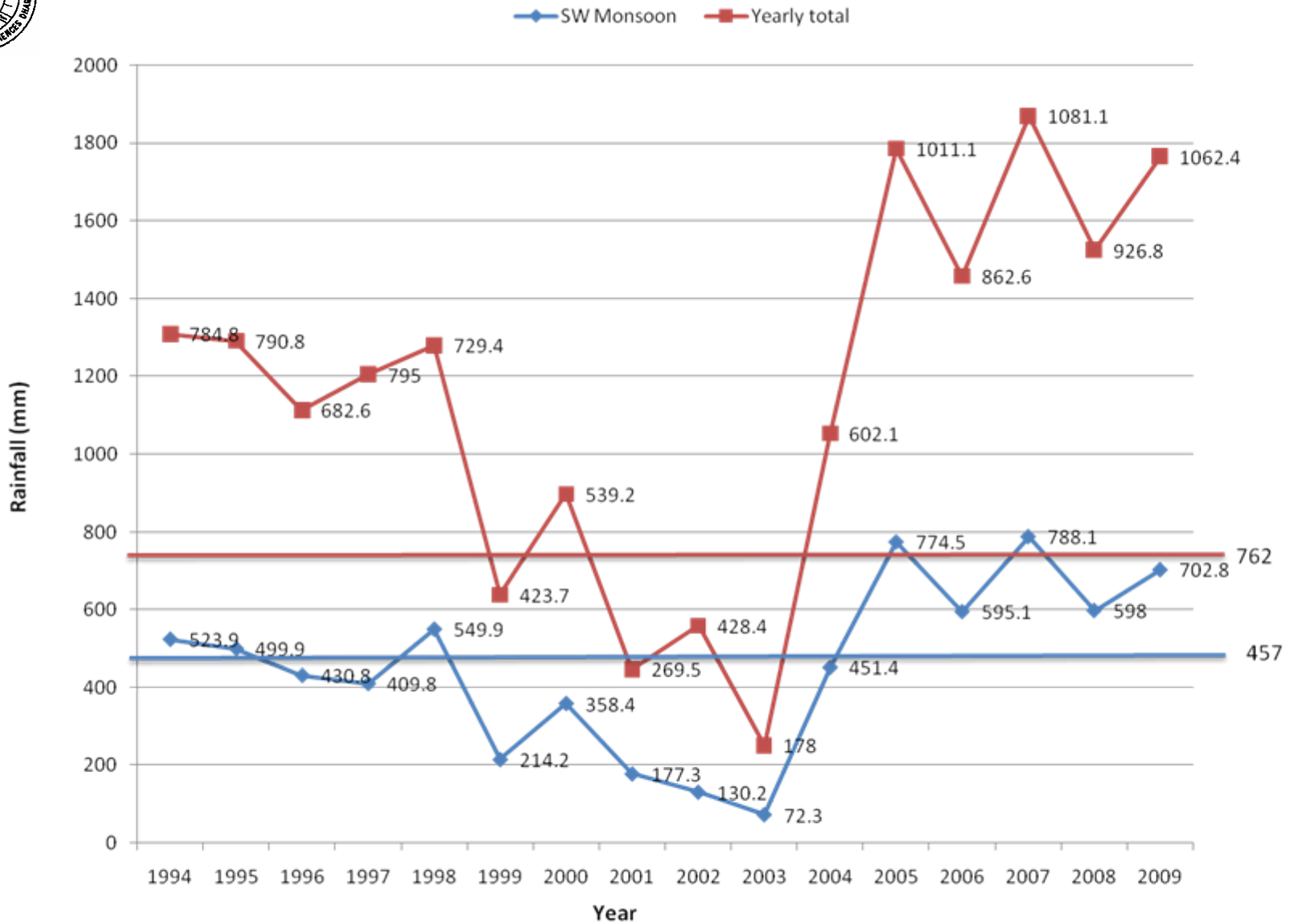
Annual Rainfall (mm) at MARS, Dharwad (1974 -2009)



## Seasonal Rainfall (mm) Variability between 1994 to 2009 (16 years) at Main Agricultural Research Station, Dharwad (Karnataka)

Seasons	Normal	1994	1995	1996	1997	1998	1999*	2000*	2001*	2002*	2003*	2004*	2005	2006	2007	2008	2009
<b>I. Pre monsoon</b> (Jan-May) % D from N	136.0 --	91.6 -32.6	82.4 -39.4	83.8 -38.4	179.9 +32.3	41.2 -69.7	47.5 -65.1	89.5 -34.2	75.2 -44.7	187.6 (63 a) +37.9	55.1 -59.5	85.2 -37.1	109.2 -19.7	173.5 +27.6	164.2 +20.7	196.0 +44.1	173.4 +27.4
<b>II. SW Monsoon</b> (June-Sept) % D from N	457.7 -	523.9 +14.5	499.9 +9.2	430.8 -5.9	409.8 -10.5	549.9 +20.2	214.2 -53.2	358.4 -21.7	177.3 -61.3	130.2 -71.6	72.3 -84.2	451.4 -1.4	774.5 +69.2	595.1 +30.0	788.1 +72.2	598.0 +30.7	702.8 +53.5
<b>III. Post monsoon</b> (Oct – Dec) % D from N	168.4 -	169.2 +0.5	208.5 +23.5	168.0 +0.6	205.3 +21.9	138.3 -17.9	160.7 -4.6	91.3 -45.8	17.0 -89.9	110.6 -34.3	50.6 -70.1	65.2 -61.3	127.4 -24.3	94.0 -44.2	128.8 -23.5	132.6 -21.3	186.4 +10.6
<b>IV. Yearly total</b> % D from N	762.1 --	784.8 +3.0	790.8 +3.8	682.6 -10.4	795.0 +4.3	729.4 -4.3	423.7* -44.0	539.2* -29.2	269.5* -64.6	428.4* -43.8	178.0* -76.6	602.1* -21	1011.1 +32.7	862.6 +13.2	1081.1 +41.9	926.8 +21.6	1062.4 +39.4
<b>Rainfall</b>	--	N	N	N	N	N	MD	M	SD	MD	S	SLD	E	N	E	E	E

\*Deficit rainfall years    -Excess rainfall    **N** = Normal (Mean±19 %) , **E** = Excess , **D** = Deficit  
 Drought Intensity (IMD) years **SLD** – Slight Drought (-11 to -25%)    **MD**- Moderate Drought (-26 to -49%)    **S**- Severe Drought (-50 % & above)



**SWM and annual rainfall variability between 1994- 2009(16 years) at MARS, Dharwad**



## Annual Rainfall (mm) Variability between 1974 – 2009 (36 years) at Main Agricultural Research Station, Dharwad (Karnataka)

Period	Range	Mean	S D	CV %
<b>I.</b> 1974 – 2009 (36 years) % D from N	178 - 1081 (2003) (2007) -75 +51	714.0	208.6	29.2
<b>II.</b> 1974 – 1998 ( 25 years ) % D from N	547 - 1047 (1985) (1991) -23 +46	735.3	134.5	18.1
<b>III.</b> 1999 -2004 (6 years) % D from N	178 - 602.1 (2003) (2004) -75 -16	406.5	159.8	39.3
<b>IV.</b> 2005 – 2009 (5 years) % D from N	862.6 - 1081.1 (2006) (2007) +21.1 +54	979.9	85.5	6.7



# Conclusion

- Annual rainfall trend indicated

- Normal rainfall up to 1998 with CV 18.1 % and moderate dependability.

- Deficit with slight to severe intensity droughts from 1999 to 2004 (6 Years) with CV

- 39.3 % and very low dependability

- Excess in recent years :2005-2009 (5 Years) with CV 6.7 % and higher dependability

- Which Indicate greater variability over the years.

- Rainfall during SWM season (June to Sept.) followed similar trend as that of annual rainfall.

- Recent years excess rainfall (2005-2009) was not observed during earlier period (1974-2004)