WIFEX

The WInter Fog EXperiment

The Winter Fog Experiment (WIFEX) has been launched by the Ministry of Earth Sciences (MoES) at the Indira Gandhi International Airport (IGIA), New Delhi. The aim of the observational campaign is to achieve the better understanding of the fog life cycle and improve capability in fog prediction. The programme is to provide a better understanding of fog occurrence, its prediction under anticipated climate change scenarios which will be helpful in devising remedial measures to be adopted in farm management, other related R&D activities in agriculture production systems, water resources, economy, transportation (rail, road and air), public health and communication etc. On the basis of last year experience, it was observed that more observations are needed over upwind direction in the region of pre-dominant agricultural activities. For the purpose, CCS Haryana Agricultural University is the pioneer and most suited institute to take observation of the meteorological variables at different heights (up to 10 meter) because the thick fog occurred at ground level affecting agricultural production systems and other developmental activities. This joint research observational effort is to further understand the meteorological conditions in the region during foggy days which will be mutually beneficial for more research and development activities in both the institutes of National & International repute. In addition to Indian Institute of Tropical Meteorology (IITM), Pune, India Meteorology Department (IMD), National Center for Medium Range Weather Forecast (NCMRWF), Airport Authority of India, GMR, Indira Gandhi International Airport and Indian Institute of Science Education and Research (IISER) Mohali; Chaudhary Charan Singh Haryana Agricultural University (CCS HAU), Hisar is also active collaborator and participating institute in WIFEX observational campaign since 2016-17.

I. Observational Activities

WIFEX

The WInter Fog EXperiment

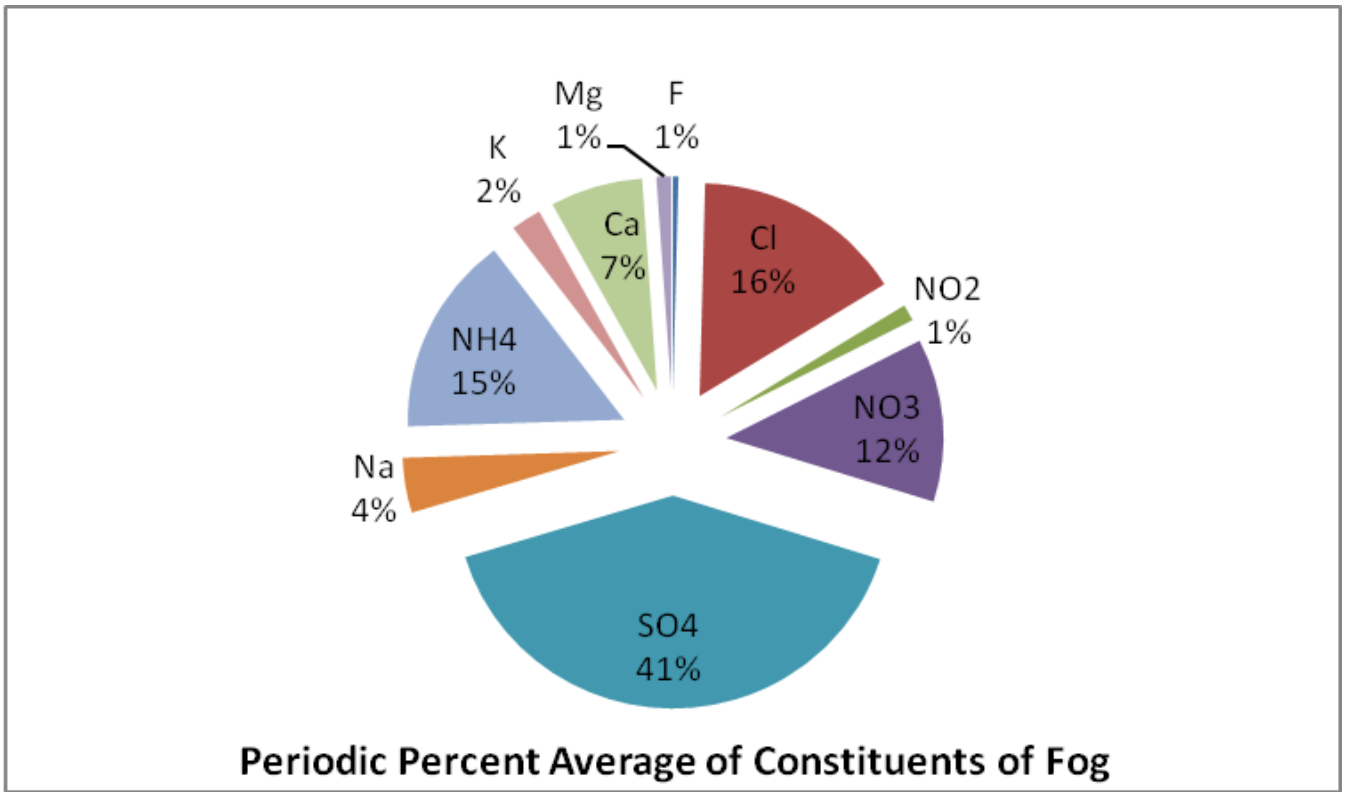
Dept of Agril Meteorology, CCS HAU Hisar

II. Observations Recorded

a) Fog water samples:

Date	F	Cl	NO_2	NO_3	SO_4	Na	NH_4	K	Ca	Mg	ML
12 Dec, 16	6.73	302.72	7.84	271.87	814.05	21.75	284.00	30.73	154.15	14.81	15.0
24 Dec, 16	12.37	348.30	2.42	305.97	1255.29	18.95	428.80	61.81	145.04	19.69	05.0
05 Jan, 17	1.66	103.61	9.58	47.31	127.26	3.25	98.56	7.76	22.20	1.60	17.5
20 Jan, 17	0.69	14.10	6.37	17.84	39.88	1.43	30.23	4.21	9.73	0.03	20.0
01 Feb, 17	0.13	20.82	2.66	13.72	42.29	3.31	30.76	3.57	15.65	1.08	10.0

in mg/l



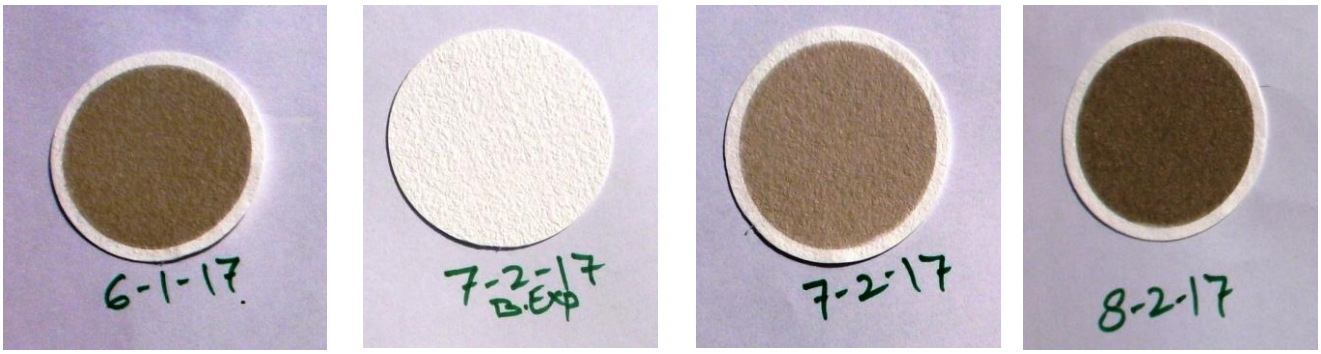
Periodic Percent Average of Constituents of Fog

b) Air samples (PM1.0):

Date	Cl	NO_2	NO_3	SO_4	Na	NH_4	K	Ca	Mg	Total mass Conc.
12 Dec, 16	2.988	0.018	3.009	4.462	1.849	1.767	1.321	1.781	0.147	157.1
24 Dec, 16	2.899	0.021	5.199	6.560	2.759	2.223	0.811	2.691	0.165	188.3
05 Jan, 17	1.797	0.017	1.537	3.044	2.106	2.168	0.199	1.927	0.095	115.4
20 Jan, 17	2.218	0.008	1.786	2.901	2.095	0.671	0.573	1.724	0.125	144.0
01 Feb, 17	2.176	0.006	1.055	2.704	1.758	0.915	0.444	2.020	0.312	151.4

In $\mu g/m^3$

c) Visible observation of air samples (PM1.0)



a. 6 Jan, 2017 **b. Blank Exposure** **c. 7 Feb, 2017** **d. 8 Feb, 2017**

Visible observation of air samples (PM1.0) are presented here above in Fig a,b,c,d. While doing chemical analysis of air samples at IITM, Pune, the total mass concentration of PM1.0 samples recorded was 115.4 $\mu g/m^3$ (6^{th} Jan), 145.0 $\mu g/m^3$ (7^{th} Feb) and 138.0 $\mu g/m^3$ (8^{th} Feb) samples during the winter season well above the acceptable limit of 40-60 $\mu g/m^3$. Among the total PM concentration, Sulphate contribution was maximum (3.236 to 4.140 $\mu g/m^3$). The weather conditions (particularly wind speed/direction) were comparatively calm during the sample days. The pollutants and particulate matter reduces the radiation quality and alter the stomata activities in crops plants consequently more detrimental for plant biological activities.

d) Weather conditions:

Date	Tmax ^{0}C	Tmin ^{0}C	RH_M %	RH_E %	WS Km/hr	WD_M deg	WD_E deg	BSSH hrs	Evap mm	Rain mm	Weather Remarks
12 Dec, 16	26.2	10.0	100	52	1.9	00	11	7.0	1.8	00	Fog
24 Dec, 16	26.4	06.0	100	70	1.2	11	11	7.5	0.9	00	Fog
05 Jan, 17	23.5	09.7	100	80	3.2	23	25	6.1	0.8	00	Fog
20 Jan, 17	17.4	02.3	100	57	2.7	25	34	7.0	1.0	00	Fog/PC
01 Feb, 17	21.1	06.4	100	57	2.0	00	29	7.0	1.5	00	Fog

e) Shortwave and longwave radiation (W/m^2)