

METEOROLOGICAL SERVICE



November 1987

AGROMETEOROLOGICAL BULLETIN

The Weather of November

Summary:

High pressure dominated, except for a disturbed spell from 11th to 16th and northerly winds from 22nd to 25th. The weather was dry, mild and dull except in the southwest where sunshine was well above normal.

Meteorological Situation:

The month opened with a spell of dry weather and high pressure which gave way to rain associated with a low pressure centre drifting down over Ireland on 7th/8th. Apart from 9th, the following spell of weather was disturbed and windy as complex depressions swept eastwards in the Atlantic and associated frontal troughs affected the country. A deep centre of low pressure off the northern coasts resulted in widespread westerly gales on 12th. Apart from showers in a northwesterly airflow on 13th, troughs advanced from the west over the following few days. Extensive high pressure over Europe caused freshening southwest winds with accompanying rain and the mildest spell of the month on 17th/18th.

When the European high centre drifted westwards into the Atlantic, cooler northwesterly winds over Ireland from 19th to 21st, and northerly winds on 22nd, gave spells of rain or showers. As the Atlantic high extended towards Iceland and extensive low pressure developed over Europe a strengthening northeasterly airflow developed over Ireland to 25th (although a temporary easing occurred on 24th under the influence of a ridge). The weather over the country for the remainder of the month was influenced by the return of the high pressure area to Europe apart from temporary interruptions by troughs on 26th and mild southerly winds on 28th. By the end of the month high pressure had settled over Scotland and temperatures declined further.

Precipitation:

Amounts were well below normal in most places varying from 57% of normal at Malin Head and Fermoy to 111% at Ballinamore. Wettest days occurred on 8th and 9th and on 29th.

Temperature:

Mean air temperature was above normal except in parts of the East. Deviations from average varied from 0.7°C above normal at Clones to 0.3°C below at Casement Aerodrome. Soil temperatures (100mm) were mostly above normal being up to 2.5°C above in the period 16th to 20th, but greatly declined in subsequent days. Air frost was widespread on 25th and 30th and some instances occurred from 26th to 28th. Ground frost occurred on twenty one nights and was most widespread and sharpest on 25th, 26th, 30th, 5th, 14th, 6th, 11th and 23rd respectively.

Sunshine and Radiation:

Apart from the southwest where sunshine was above to well above normal, and normal in the extreme north, for most of the country it was below to well below normal. Sunshine hours for the month varied from 136% of normal at Cahirciveen to 67% at Dublin Airport. Global radiation varied from 87% of normal at Dublin Airport to 122% of normal at Valentia.

Wind:

Gales occurred extensively on 11th/12th, and on 23rd/24th in southwestern areas. Gale gusts were widespread on 10th/11th, 15th/16th, 18th and 22nd to 24th.

The data contained in this Bulletin are provisional. Some of the material in Table 1 will be published in its final form in the Monthly Weather Report; final values of Global Radiation at stations in Table 2 will be published in the annual Solar Radiation Observations.

TABLE 1

NOVEMBER 1987

STATION	PERIOD	RAINFALL (mm)				TEMPERATURE (°C)															BRIGHT SUNSHINE		WIND			
		AMOUNT	% OF AVERAGE	RAIN DAYS	WET DAYS	AIR										GROUND		SOIL (10cm)			TOTAL NO. OF HOURS	% OF AVERAGE	MEAN SPEED (ms ⁻¹)	DAYS WITH GALE GUSTS	P.E. (PENMAN) (mm)	
						MEAN MAX.	MEAN MIN.	MEAN DAILY	DIFFERENCE FROM AVERAGE	LOWEST MIN.	DATE	DAYS WITH AIR FROST	DEGREE DAYS ABOVE 4.4 °C	% OF AVERAGE	DEGREE DAYS ABOVE 10.0 °C	% OF AVERAGE	LOWEST "GRASS-MIN"	DATE	DAYS WITH GROUND FROST	MEAN DAILY						DIFFERENCE FROM AVERAGE
Carlow (Oak Park) Co. Carlow	1-10	27.0	-	4	4	10.9	5.5	8.2	-	2.8	3	0	39	-	3	-	-1.5	6	3	-	-	16.0	-	N/A	-	-
	11-20	21.1	-	6	4	10.7	4.8	7.8	-	2.8	13	0	35	-	3	-	-0.7	11	2	-	-	17.7	-	N/A	-	-
	21-END	5.6	-	2	2	6.6	1.9	4.2	-	-1.8	25	3	10	-	0	-	-6.5	25	3	-	-	20.8	-	1.2	-	-
	MONTH	53.7	73	12	10	9.4	4.1	6.7	-	-1.8	25	3	84	-	6	-	-6.5	25	8	-	-	54.5	-	N/A	-	N/A
Shannon Airport Co. Clare	1-10	22.8	-	4	4	11.6	6.3	9.0	-	4.6	3	0	46	-	4	-	-0.5	5	2	8.7	-	12.8	-	2.8	1	-
	11-20	40.9	-	8	8	11.7	6.7	9.2	-	4.6	12	0	48	-	7	-	-0.7	11	2	8.0	-	19.1	-	5.9	3	-
	21-END	6.1	-	4	1	8.3	2.5	5.4	-	-1.5	25	2	18	-	0	-	-7.5	25	6	5.4	-	36.1	-	3.5	2	-
	MONTH	69.8	71	16	13	10.6	5.2	7.9	+0.4	-1.5	25	2	112	93	11	55	-7.5	25	10	7.3	-0.1	68.0	117	4.0	6	10
Cork Airport Co. Cork	1-10	14.6	-	4	3	10.9	7.2	9.0	-	2.8	2	0	47	-	3	-	-0.1	2	1	9.4	-	9.9	-	5.2	3	-
	11-20	47.9	-	9	6	10.7	5.7	8.2	-	2.1	13	0	39	-	4	-	-2.4	13	1	7.9	-	27.7	-	7.2	6	-
	21-END	11.7	-	3	1	7.4	2.6	5.0	-	-0.8	25	1	13	-	0	-	-3.3	25	3	5.8	-	31.1	-	6.1	3	-
	MONTH	74.2	65	16	10	9.7	5.2	7.4	+0.1	-0.8	25	1	99	92	7	-	-3.3	25	5	7.7	+0.7	68.7	107	6.2	12	10
Fermoy (Coolnakilla) Co. Cork	1-10	30.7	-	5	4	10.0	6.4	8.2	-	4.3	2	0	38	-	1	-	0.5	2	0	-	-	9.6	-	3.7	-	-
	11-20	36.4	-	10	7	10.0	4.4	7.2	-	1.1	13	0	30	-	2	-	-1.0	13	2	-	-	N/A	-	5.3	-	-
	21-END	7.6	-	5	2	6.6	2.0	4.3	-	-1.6	25	2	10	-	0	-	-1.6	25	2	-	-	30.5	-	5.2	-	-
	MONTH	74.7	-	20	13	8.9	4.3	6.6	-	-1.6	25	2	78	-	3	-	-1.6	25	4	-	-	N/A	-	4.7	-	N/A
Fermoy (Moore Park) Co. Cork	1-10	23.5	-	4	4	11.2	6.4	8.8	-	2.0	3	0	44	-	3	-	-1.7	3	3	-	-	8.3	-	N/A	-	-
	11-20	23.3	-	8	6	11.3	4.6	8.0	-	-1.0	13	1	39	-	6	-	-5.4	13	5	-	-	23.7	-	N/A	-	-
	21-END	7.4	-	3	2	7.4	2.3	4.9	-	-2.2	30	2	13	-	0	-	-7.0	30	4	-	-	24.0	-	N/A	-	-
	MONTH	54.2	57	15	12	10.0	4.4	7.2	-	-2.2	30	3	96	-	9	-	-7.0	30	12	-	-	56.0	-	N/A	-	N/A
Roches Point Co. Cork	1-10	8.6	-	4	3	11.6	8.5	10.1	-	5.5	2	0	57	-	6	-	0.9	2	0	9.9	-	11.4	-	5.4	3	-
	11-20	39.9	-	7	5	11.3	6.8	9.1	-	3.6	13	0	47	-	6	-	-0.2	13	1	8.5	-	26.9	-	8.0	7	-
	21-END	9.2	-	1	1	8.4	4.5	6.4	-	1.7	25	0	22	-	0	-	-1.5	25	4	6.3	-	34.1	-	7.1	3	-
	MONTH	57.7	66	12	9	10.4	6.6	8.5	+0.0	1.7	25	0	126	93	12	57	-1.5	25	5	8.2	-0.1	72.4	103	6.8	13	15
Glencolumbkille Co. Donegal	1-10	38.2	-	4	4	10.7	5.6	8.1	-	4.3	6	0	37	-	2	-	0.5	6	0	-	-	N/A	-	3.1	-	-
	11-20	73.7	-	10	9	10.7	5.7	8.2	-	3.0	12	0	38	-	3	-	0.5	12	0	-	-	N/A	-	6.2	-	-
	21-END	29.6	-	9	7	8.4	3.9	6.1	-	2.0	25	0	20	-	0	-	-1.3	25	3	-	-	N/A	-	3.8	-	-
	MONTH	141.5	-	23	20	9.9	5.0	7.5	-	2.0	25	0	95	-	5	-	-1.3	25	3	-	-	N/A	-	4.4	-	N/A

TABLE 1 (CONTINUED)

NOVEMBER 1987

STATION	PERIOD	RAINFALL (mm)				TEMPERATURE (°C)														BRIGHT SUNSHINE		WIND								
		AMOUNT	% OF AVERAGE	RAIN DAYS	WET DAYS	AIR							GROUND			SOIL (10cm)				TOTAL NO. OF HOURS	% OF AVERAGE	MEAN SPEED (ms ⁻¹)	DAYS WITH GALE GUSTS	P.E. (PENMAN) (mm)						
						MEAN MAX.	MEAN MIN.	MEAN DAILY	DIFFERENCE FROM AVERAGE	LOWEST MIN.	DATE	DAYS WITH AIR FROST	DEGREE DAYS ABOVE 4.4°C	% OF AVERAGE	DEGREE DAYS ABOVE 10.0°C	% OF AVERAGE	LOWEST "GRASS-MIN"	DATE	DAYS WITH GROUND FROST						MEAN DAILY	DIFFERENCE FROM AVERAGE				
Glenties Co. Donegal	1-10	32.8	-	4	4	10.5	5.9	8.2	-	3.0	6	0	38	-	2	-	-1.7	6	3	-	-	-	-	-	-	-	-	-	-	-
	11-20	83.5	-	10	10	10.5	4.1	7.3	-	-5.0	13	1	35	-	3	-	-2.8	14	4	-	-	-	-	-	-	-	-	-	-	
	21-END	22.9	-	9	7	7.9	2.5	5.2	-	-2.3	25	2	15	-	0	-	-6.6	25	7	-	-	-	-	-	-	-	-	-	-	
	MONTH	139.2	84	23	21	9.6	4.2	6.9	-	-5.0	13	3	88	-	5	-	-6.6	25	14	-	-	-	-	-	-	-	-	-	-	-
Malin Head Co. Donegal	1-10	11.3	-	4	2	11.0	7.1	9.0	-	3.5	6	0	47	-	5	-	-1.0	5	1	8.6	-	18.1	-	5.7	1	-	-	-	-	
	11-20	45.0	-	10	8	10.9	6.8	8.8	-	3.0	12	0	45	-	5	-	1.9	11	0	7.7	-	11.6	-	11.8	10	-	-	-	-	
	21-END	11.6	-	7	4	8.7	5.1	6.9	-	2.6	30	0	26	-	0	-	2.4	27	0	6.1	-	17.8	-	9.6	5	-	-	-	-	
	MONTH	67.9	57	21	14	10.2	6.3	8.3	+0.6	2.6	30	0	117	104	9	-	-1.0	5	1	7.5	+0.6	47.5	102	9.1	16	18	-	-	-	
Casement Aerodrome Co. Dublin	1-10	20.9	-	4	4	11.1	4.1	7.6	-	-1.9	6	1	36	-	3	-	-4.9	6	4	7.8	-	25.5	-	3.0	1	-	-	-	-	
	11-20	20.7	-	7	5	10.6	5.2	7.9	-	2.1	14	0	36	-	5	-	0.5	14	0	6.9	-	14.6	-	9.8	7	-	-	-	-	
	21-END	4.3	-	2	1	7.0	0.4	3.7	-	-2.7	30	5	9	-	0	-	-6.6	25	6	4.5	-	12.6	-	4.9	2	-	-	-	-	
	MONTH	45.9	66	13	10	9.6	3.3	6.4	-0.3	-2.7	30	6	81	80	8	-	-6.6	25	10	6.4	-	52.7	82	5.9	10	8	-	-	-	
Dublin Airport Co. Dublin	1-10	20.0	-	3	3	11.2	6.5	8.9	-	2.4	6	0	45	-	4	-	-3.0	6	2	8.5	-	13.8	-	2.7	1	-	-	-	-	
	11-20	20.8	-	7	4	10.8	5.6	8.2	-	1.8	14	0	39	-	5	-	-1.0	14	1	7.1	-	20.2	-	7.7	4	-	-	-	-	
	21-END	7.0	-	4	3	6.5	1.8	4.1	-	0.0	30	0	10	-	0	-	-4.8	25	5	5.0	-	11.9	-	4.4	0	-	-	-	-	
	MONTH	47.8	69	14	10	9.5	4.6	7.1	+0.1	0.0	30	0	94	90	9	-	-4.8	25	8	7.0	+0.5	45.9	67	4.9	5	10	-	-	-	
Kinsealy Co. Dublin	1-10	20.1	-	4	3	11.3	5.5	8.4	-	-0.4	6	1	42	-	4	-	-5.3	6	3	-	-	13.8	-	2.0	-	-	-	-	-	
	11-20	21.6	-	6	4	11.2	5.3	8.3	-	1.9	14	0	40	-	6	-	-1.9	11	2	-	-	20.6	-	5.3	-	-	-	-	-	
	21-END	7.2	-	3	2	7.4	1.6	4.5	-	-1.5	28	3	12	-	0	-	-5.7	27	6	-	-	15.4	-	3.7	-	-	-	-	-	
	MONTH	48.9	73	13	9	10.0	4.1	7.1	-	-1.5	28	4	94	-	9	-	-5.7	27	11	-	-	49.8	-	3.7	-	5	-	-	-	
Galway Co. Galway	1-10	23.3	-	4	4	11.0	4.7	7.8	-	1.5	7	0	36	-	3	-	1.1	6	0	8.0	-	11.2	-	2.5	1	-	-	-	-	
	11-20	49.9	-	9	6	11.2	6.3	8.7	-	3.5	14	0	44	-	5	-	0.0	14	0	7.6	-	17.4	-	5.6	5	-	-	-	-	
	21-END	8.2	-	3	2	8.3	3.1	5.7	-	-1.0	30	2	19	-	0	-	-5.0	30	3	5.2	-	34.2	-	2.9	2	-	-	-	-	
	MONTH	81.4	70	16	12	10.2	4.7	7.4	+0.3	-1.0	30	2	99	-	8	-	-5.0	30	3	6.9	-	62.8	97	3.7	8	5	-	-	-	
Killarney (Muckross House) Co. Kerry	1-10	35.2	-	4	3	12.3	5.5	8.9	-	0.8	2	0	46	-	6	-	-0.5	1	2	-	-	22.0	-	-	-	-	-	-	-	
	11-20	63.7	-	10	9	11.7	5.5	8.6	-	2.7	11	0	43	-	7	-	-1.2	13	4	-	-	9.1	-	-	-	-	-	-	-	
	21-END	9.5	-	5	2	8.3	1.2	4.7	-	-3.6	30	3	16	-	0	-	-4.6	25	7	-	-	16.6	-	-	-	-	-	-	-	
	MONTH	108.4	63	19	14	10.8	4.0	7.4	-	-3.6	30	3	106	-	13	-	-4.6	25	13	-	-	47.7	-	-	-	-	-	-	-	

NOTES ON THE TABLES IN JANUARY ISSUE

TABLE 1 (CONTINUED)

NOVEMBER 1987

STATION	PERIOD	RAINFALL (mm)				TEMPERATURE (°C)														BRIGHT SUNSHINE		WIND		P.E. (PENMAN) (mm)		
		AMOUNT	% OF AVERAGE	RAIN DAYS	WET DAYS	AIR										GROUND		SOIL (10cm)		TOTAL NO. OF HOURS	% OF AVERAGE	MEAN SPEED (ms ⁻¹)	DAYS WITH GALE GUSTS			
						MEAN MAX.	MEAN MIN.	MEAN DAILY	DIFFERENCE FROM AVERAGE	LOWEST MIN.	DATE	DAYS WITH AIR FROST	DEGREE DAYS ABOVE 4.4°C	% OF AVERAGE	DEGREE DAYS ABOVE 10.0°C	% OF AVERAGE	LOWEST "GRASS-MIN"	DATE	DAYS WITH GROUND FROST						MEAN DAILY	DIFFERENCE FROM AVERAGE
Cahirciveen (Valentia Obsy.) Co. Kerry	1-10	23.4	-	4	4	13.4	7.1	10.2	-	2.8	2	0	59	-	12	-	1.0	2	0	9.5	-	31.5	-	4.8	3	-
	11-20	59.6	-	9	7	11.7	7.9	9.8	-	5.0	13	0	54	-	8	-	2.5	14	0	9.1	-	13.4	-	7.6	8	-
	21-END	11.2	-	6	3	9.7	4.0	6.9	-	-0.6	30	1	28	-	1	-	-3.6	30	2	6.9	-	25.3	-	5.8	3	-
	MONTH	94.2	62	19	14	11.6	6.3	9.0	+0.2	-0.6	30	1	141	97	20	77	-3.6	30	2	8.5	+0.2	70.2	136	6.1	14	18
Ardfert (Liscahane) Co. Kerry	1-10	24.5	-	4	3	8.7	8.0	8.4	-	6.7	10	0	40	-	0	-	-1.5	3	2	-	-	25.6	-	-	-	-
	11-20	49.5	-	9	9	9.6	8.6	9.1	-	5.2	12	0	47	-	7	-	-1.8	14	1	-	-	18.1	-	-	-	-
	21-END	14.1	-	4	4	4.5	3.8	4.2	-	-1.9	25	2	10	-	0	-	-8.9	25	5	-	-	26.2	-	-	-	-
	MONTH	88.1	-	17	16	7.6	6.8	7.2	-	-1.9	25	2	96	-	7	-	-8.9	25	8	-	-	69.9	-	-	-	-
Lullymore Co. Kildare	1-10	24.5	-	4	4	10.8	3.8	7.3	-	-1.9	6	2	34	-	3	-	-7.0	6	4	-	-	19.6	-	2.5	-	-
	11-20	29.8	-	7	5	10.4	3.9	7.1	-	0.2	14	0	31	-	3	-	-4.5	14	5	-	-	16.1	-	5.3	-	-
	21-END	10.1	-	4	3	6.6	0.7	3.6	-	-3.9	30	4	9	-	0	-	-11.5	30	8	-	-	27.5	-	****	-	-
	MONTH	64.4	81	15	12	9.2	2.8	6.0	-	-3.9	30	6	73	-	5	-	-11.5	30	17	-	-	63.2	-	-0.8	-	-4
Kilkenny Co. Kilkenny	1-10	15.1	-	3	3	11.0	5.7	8.4	-	1.8	3	0	41	-	3	-	-1.4	3	3	8.2	-	10.3	-	1.5	0	-
	11-20	42.3	-	7	5	11.5	4.8	8.1	-	-0.1	14	1	40	-	6	-	-4.4	14	4	7.1	-	22.4	-	4.1	3	-
	21-END	8.1	-	3	2	7.5	2.0	4.7	-	-1.7	30	2	12	-	0	-	-7.8	30	3	5.1	-	29.7	-	3.1	2	-
	MONTH	65.5	85	13	10	10.0	4.2	7.1	+0.6	-1.7	30	3	93	89	9	-	-7.8	30	10	6.8	+0.5	62.4	96	2.9	5	5
Mooncoin (Silverspring) Co. Kilkenny	1-10	20.6	-	4	3	11.3	5.8	8.6	-	2.5	2	0	43	-	3	-	-1.9	4	3	-	-	11.8	-	-	-	-
	11-20	27.4	-	6	5	11.4	4.6	8.0	-	-0.8	13	1	39	-	5	-	-5.6	13	4	-	-	23.6	-	-	-	-
	21-END	9.2	-	4	3	7.4	2.7	5.0	-	-0.4	25	2	14	-	0	-	-6.8	30	6	-	-	30.5	-	-	-	-
	MONTH	57.2	62	14	11	10.0	4.4	7.2	-	-0.8	13	3	95	-	8	-	-6.8	30	13	-	-	65.9	-	-	-	-
Ballinamore Co. Leitrim	1-10	18.7	-	4	4	10.1	4.0	7.0	-	-0.8	6	1	29	-	1	-	-4.1	6	5	-	-	5.3	-	0.9	-	-
	11-20	98.8	-	10	10	10.4	4.1	7.3	-	-0.1	11	1	32	-	2	-	-3.5	11	2	-	-	14.4	-	3.9	-	-
	21-END	14.0	-	6	3	7.2	2.5	4.9	-	-1.6	25	1	12	-	0	-	-6.0	25	5	-	-	24.9	-	2.7	-	-
	MONTH	131.5	111	20	17	9.2	3.5	6.4	-	-1.6	25	3	73	-	4	-	-6.0	25	12	-	-	44.6	-	2.5	-	0
Ardee (Boharnamoe) Co. Louth	1-10	27.0	-	5	4	11.1	5.0	8.0	-	1.1	1	0	38	-	3	-	-3.0	6	2	-	-	-	-	-	-	-
	11-20	36.9	-	8	5	10.9	4.5	7.7	-	0.9	14	0	36	-	3	-	-1.9	14	1	-	-	-	-	-	-	-
	21-END	4.1	-	2	1	10.3	1.6	5.9	-	-2.6	30	1	23	-	1	-	-5.4	24	3	-	-	-	-	-	-	-
	MONTH	68.0	85	15	10	10.7	3.7	7.2	-	-2.6	30	1	96	-	8	-	-5.4	24	6	-	-	-	-	-	-	-

NOTES ON THE TABLES IN JANUARY ISSUE

TABLE 1 (CONTINUED)

NOVEMBER 1987

STATION	PERIOD	RAINFALL (mm)				TEMPERATURE (°C)																BRIGHT SUNSHINE		WIND		P.E. (PENMAN) (mm)
		AMOUNT	% OF AVERAGE	RAIN DAYS	WET DAYS	AIR										GROUND		SOIL (10cm)		TOTAL NO. OF HOURS	% OF AVERAGE	MEAN SPEED (ms ⁻¹)	DAYS WITH GALE GUSTS			
						MEAN MAX.	MEAN MIN.	MEAN DAILY	DIFFERENCE FROM AVERAGE	LOWEST MIN.	DATE	DAYS WITH AIR FROST	DEGREE DAYS ABOVE 4.4°C	% OF AVERAGE	DEGREE DAYS ABOVE 10.0°C	% OF AVERAGE	LOWEST "GRASS-MIN"	DATE	DAYS WITH GROUND FROST					MEAN DAILY	DIFFERENCE FROM AVERAGE	
Ballinrobe (Creagh) Co. Mayo	1-10	31.2	-	5	4	10.1	3.9	7.0	-	1.0	6	0	30	-	1	-	-2.2	5	6	-	-	4.7	-	2.3	-	-
	11-20	58.5	-	9	8	11.4	5.4	8.4	-	3.0	11	0	41	-	4	-	-1.5	13	5	-	-	N/A	-	4.9	-	-
	21-END	13.8	-	7	3	8.5	1.9	5.2	-	-4.2	30	2	18	-	0	-	-9.5	30	7	-	-	24.4	-	2.1	-	-
	MONTH	103.5	74	21	15	10.0	3.7	6.9	-	-4.2	30	2	88	-	6	-	-9.5	30	18	-	-	N/A	-	3.2	-	N/A
Belmullet Co. Mayo	1-10	32.0	-	4	4	11.6	5.5	8.5	-	2.1	6	0	42	-	4	-	-1.2	6	3	8.9	-	18.6	-	4.1	1	-
	11-20	45.2	-	9	7	11.0	7.0	9.0	-	5.0	11	0	46	-	4	-	2.1	12	0	8.3	-	12.4	-	9.5	7	-
	21-END	14.2	-	7	6	9.2	4.5	6.9	-	-1.7	30	1	27	-	0	-	-4.9	30	1	7.1	-	17.8	-	6.2	3	-
	MONTH	91.4	72	20	17	10.6	5.7	8.1	+0.0	-1.7	30	1	115	95	9	-	-4.9	30	4	8.1	+0.5	48.8	94	6.6	11	13
Claremorris Co. Mayo	1-10	24.1	-	4	4	10.1	4.0	7.0	-	0.8	6	0	30	-	1	-	-2.0	6	4	7.6	-	5.3	-	2.0	1	-
	11-20	50.2	-	9	8	10.5	5.0	7.8	-	1.7	13	0	36	-	4	-	-3.4	14	3	7.1	-	13.1	-	5.2	4	-
	21-END	16.0	-	4	4	8.0	1.8	4.9	-	-2.5	30	3	15	-	0	-	-8.6	30	7	5.1	-	25.4	-	2.9	2	-
	MONTH	90.3	77	17	16	9.6	3.6	6.6	+0.2	-2.5	30	3	81	87	4	-	-8.6	30	14	6.6	+0.3	43.8	80	3.3	7	2
Glenamoy Co. Mayo	1-10	32.1	-	4	4	11.1	4.9	8.0	-	-0.5	6	1	39	-	4	-	-2.6	6	3	-	-	16.9	-	2.1	-	-
	11-20	51.2	-	9	7	10.6	6.4	8.5	-	3.7	12	0	41	-	3	-	0.5	14	0	-	-	12.6	-	5.8	-	-
	21-END	20.1	-	8	6	8.7	3.7	6.2	-	-3.4	30	1	22	-	0	-	-5.9	30	2	-	-	16.3	-	3.3	-	-
	MONTH	103.4	65	21	17	10.2	5.0	7.6	-	-3.4	30	2	102	-	7	-	-5.9	30	5	-	-	45.8	-	3.7	-	1
Dunsany (Grange) Co. Meath	1-10	23.5	-	4	4	10.6	4.0	7.3	-	-2.0	6	3	34	-	2	-	-5.5	6	3	-	-	17.0	-	-	-	-
	11-20	26.9	-	8	7	10.1	4.3	7.2	-	0.3	14	0	31	-	2	-	-1.6	14	2	-	-	15.8	-	-	-	-
	21-END	5.6	-	4	2	6.6	1.5	4.0	-	-3.5	30	4	10	-	0	-	-9.2	30	6	-	-	29.9	-	-	-	-
	MONTH	56.0	72	16	13	9.1	3.3	6.2	-	-3.5	30	7	75	-	4	-	-9.2	30	11	-	-	62.7	-	-	-	-
Clones Co. Monaghan	1-10	13.0	-	4	4	10.4	5.4	7.9	-	0.2	6	0	37	-	2	-	-3.2	6	3	8.3	-	5.0	-	1.2	0	-
	11-20	53.9	-	9	5	10.4	5.0	7.7	-	1.7	11	0	35	-	4	-	-2.4	11	3	7.1	-	18.0	-	4.7	2	-
	21-END	12.6	-	5	4	7.1	2.0	4.5	-	-1.3	30	2	11	-	0	-	-7.0	25	6	5.2	-	25.0	-	2.2	2	-
	MONTH	79.5	90	18	13	9.3	4.1	6.7	+0.7	-1.3	30	2	82	96	5	-	-7.0	25	12	6.9	+0.9	48.0	90	2.7	4	3
Birr Co. Offaly	1-10	11.0	-	4	4	11.1	4.4	7.7	-	-0.3	7	1	35	-	3	-	-3.6	7	4	8.0	-	15.4	-	2.1	0	-
	11-20	43.0	-	8	7	11.0	5.2	8.1	-	1.3	14	0	39	-	5	-	-1.5	14	3	7.2	-	15.2	-	4.9	3	-
	21-END	10.2	-	4	2	7.2	1.0	4.1	-	-4.3	30	3	11	-	0	-	-10.2	25	5	4.8	-	24.6	-	2.5	0	-
	MONTH	64.2	83	16	13	9.8	3.5	6.7	+0.2	-4.3	30	4	86	85	8	-	-10.2	25	12	6.6	+0.2	55.2	90	3.2	3	3

NOTES ON THE TABLES IN JANUARY ISSUE

TABLE 1 (CONTINUED)

NOVEMBER 1987

STATION	PERIOD	RAINFALL (mm)				TEMPERATURE (°C)														BRIGHT SUNSHINE		WIND		P.E. (PENMAN) (mm)														
		AMOUNT	% OF AVERAGE	RAIN DAYS	WET DAYS	AIR							GROUND			SOIL (10cm)		TOTAL NO. OF HOURS	% OF AVERAGE	MEAN SPEED (ms ⁻¹)	DAYS WITH GALE GUSTS																	
						MEAN MAX.	MEAN MIN.	MEAN DAILY	DIFFERENCE FROM AVERAGE	LOWEST MIN.	DATE	DAYS WITH AIR FROST	DEGREE DAYS ABOVE 4.4°C	% OF AVERAGE	DEGREE DAYS ABOVE 10.0°C	% OF AVERAGE	LOWEST "GRASS-MIN"					DATE	DAYS WITH GROUND FROST		MEAN DAILY	DIFFERENCE FROM AVERAGE												
Dundrum (Knockavilla) Co. Tipperary	1-10	27.7	-	4	4	10.0	3.5	7.1	-	-0.1	6	1	32	-	2	-	-0.7	6	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	11-20	30.3	-	8	6	11.2	4.3	7.7	-	-0.2	12	1	37	-	5	-	-2.4	14	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	21-END	8.4	-	3	3	7.0	1.9	4.4	-	-4.2	30	3	11	-	0	-	-6.2	30	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	MONTH	66.4	-	15	13	9.7	3.2	6.4	-	-4.2	30	5	80	-	8	-	-6.2	30	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dungarvan (Carriglea) Co. Waterford	1-10	25.9	-	4	3	11.7	6.1	8.9	-	1.5	2	0	46	-	4	-	-1.2	2	1	-	-	11.0	-	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	
	11-20	41.1	-	8	5	12.0	4.8	8.4	-	0.7	11	0	43	-	7	-	-4.6	13	5	-	-	27.6	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	21-END	8.8	-	2	1	8.4	3.3	5.9	-	-0.8	30	1	20	-	0	-	-5.7	30	5	-	-	28.4	-	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MONTH	75.8	72	14	9	10.7	4.7	7.7	-	-0.8	30	1	109	-	12	-	-5.7	30	11	-	-	67.0	-	2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Mullingar Co. Westmeath	1-10	19.6	-	4	4	10.5	4.6	7.5	-	0.9	5	0	33	-	2	-	-1.5	6	2	7.8	-	12.1	-	1.9	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	11-20	44.5	-	7	6	10.2	4.7	7.4	-	1.7	11	0	33	-	4	-	-0.5	11	1	7.0	-	17.9	-	5.3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
	21-END	8.7	-	4	3	6.8	1.4	4.1	-	-1.8	30	2	8	-	0	-	-5.4	30	5	4.6	-	32.3	-	2.6	2	-	-	-	-	-	-	-	-	-	-	-	-	-
	MONTH	72.8	80	15	13	9.1	3.6	6.3	+0.2	-1.8	30	2	74	85	5	-	-5.4	30	8	6.5	+0.5	62.3	98	3.3	5	-	-	-	-	-	-	-	-	-	-	-	-	-
J.F.K. Park Co. Wexford	1-10	30.0	-	3	3	11.3	6.4	8.9	-	1.9	2	0	45	-	3	-	-1.0	2	1	-	-	14.4	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11-20	31.0	-	5	4	11.0	5.0	8.0	-	1.8	13	0	38	-	4	-	-4.1	13	3	-	-	21.3	-	4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	21-END	11.9	-	3	2	7.3	2.8	5.0	-	-0.1	25	1	14	-	0	-	-2.4	30	6	-	-	28.7	-	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MONTH	72.9	72	11	9	9.9	4.7	7.3	-	-0.1	25	1	98	-	7	-	-4.1	13	10	-	-	64.4	-	3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Clonroche Co. Wexford	1-10	24.3	-	4	3	10.8	6.3	8.5	-	2.5	2	0	42	-	2	-	-4.6	2	3	-	-	16.9	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11-20	32.8	-	9	5	10.6	4.4	7.5	-	0.5	14	0	34	-	3	-	-3.3	11	5	-	-	23.1	-	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	21-END	10.6	-	2	1	7.0	2.8	4.9	-	0.2	30	0	11	-	0	-	-4.6	30	6	-	-	22.3	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MONTH	67.7	59	15	9	9.5	4.5	7.0	-	0.2	30	0	87	-	6	-	-4.6	2	14	-	-	62.3	-	2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Johnstown Castle Co. Wexford	1-10	41.1	-	4	4	11.3	7.4	9.4	-	5.0	2	0	50	-	3	-	-1.0	5	2	-	-	19.9	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11-20	47.7	-	6	4	10.9	5.6	8.3	-	2.7	11	0	40	-	4	-	-2.3	11	3	-	-	29.2	-	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	21-END	17.9	-	4	3	7.6	2.7	5.2	-	0.4	25	0	15	-	0	-	-4.4	28	7	-	-	28.7	-	2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MONTH	106.7	97	14	11	9.9	5.3	7.6	-	0.4	25	0	104	-	7	-	-4.4	28	12	-	-	77.8	-	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Rosslare Co. Wexford	1-10	16.5	-	4	3	11.7	8.7	10.2	-	6.8	2	0	58	-	6	-	3.0	2	0	9.9	-	23.8	-	3.9	2	-	-	-	-	-	-	-	-	-	-	-	-	-
	11-20	40.6	-	4	4	11.3	6.2	8.8	-	2.6	14	0	44	-	6	-	-0.8	14	1	8.1	-	25.1	-	5.8	5	-	-	-	-	-	-	-	-	-	-	-	-	-
	21-END	18.5	-	5	2	8.3	3.6	5.9	-	1.3	28	0	18	-	0	-	-1.5	27	2	5.8	-	23.3	-	7.0	4	-	-	-	-	-	-	-	-	-	-	-	-	-
	MONTH	75.6	76	13	9	10.4	6.2	8.3	+0.0	1.3	28	0	121	91	12	57	-1.5	27	3	7.9	+0.1	72.2	97	5.6	11	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTES ON THE TABLES IN JANUARY ISSUE

TABLE 2 GLOBAL RADIATION

STATION	PERIOD	AMOUNT MJ/m ²
Malin Head Co. Donegal	1-10	29.61
	11-20	19.62
	21-end	18.84
	Month	68.07
Dublin Airport Co. Dublin	1-10	30.84
	11-20	28.43
	21-end	21.23
	Month	80.50
Cahirciveen (Valentia Obs.) Co. Kerry	1-10	44.49
	11-20	26.96
	21-end	32.11
	Month	103.56
Kilkenny Co. Kilkenny	1-10	29.25
	11-20	31.67
	21-end	29.09
	Month	90.01
Belmullet Co. Mayo	1-10	30.21
	11-20	23.60
	21-end	21.71
	Month	75.52
Clones Co. Monaghan	1-10	23.53
	11-20	24.81
	21-end	22.28
	Month	70.62
Birr Co. Offaly	1-10	35.43
	11-20	29.37
	21-end	26.41
	Month	91.21

Notes on the tables in January issue

TABLE 3 POTENTIAL EVAPOTRANSPIRATION (P.E.) AND SOIL MOISTURE

STATION	PERIOD	P.E. (mm)		SOIL MOISTURE (mm)	
		Amount	Deficit	Accumulated Deficit	Surplus
Carlow (Oak Park) Co. Carlow	1-10	12.7	-	0	14
	11-20	-12.8	-	0	34
	21-end	1.6	-	0	4
	Month	1.5	-	-	-
Kinsealy Co. Dublin	1-10	3.9	-	0	16
	11-20	5.2	-	0	17
	21-end	3.1	-	0	4
	Month	12.2	-	-	-
Cahirciveen (Valentia Obs.) Co. Kerry	1-10	6.5	-	0	8
	11-20	-2.6	-	0	76
	21-end	5.8	-	0	7
	Month	9.7	-	-	-
Ballinamore Co. Leitrim	1-10	12.2	-	0	6
	11-20	OVERFLOW	-	0	-
	21-end	1.6	-	0	14
	Month	OVERFLOW	-	-	-
Glenamoy Co. Mayo	1-10	13.4	-	0	19
	11-20	2.6	-	0	49
	21-end	2.3	-	0	17
	Month	18.3	-	-	-
Johnstown Castle Co. Wexford	1-10	11.1	-	0	30
	11-20	1.9	-	0	46
	21-end	5.1	-	0	13
	Month	18.1	-	-	-

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TABLE 4 SOIL CLIMATE (MULLINGAR)

BARE SOIL TYPE	PERIOD	MEAN TEMPERATURE (°C at 100mm)			TEMPERATURE GRADIENT (to 200mm)	SOIL WATER POTENTIAL (hPa) (at depths)	
		Max.	Daily	Min.		75mm	200mm
		Peat	1-10	8.7	7.7	6.5	0.36
	11-20	7.9	5.5	5.5	0.11	52.7	54.3
	21-end	5.8	1.8	3.5	0.90	63.2	62.4
Mineral	1-10	9.2	7.5	6.1	0.21	76.2	78.3
	11-20	8.3	5.2	5.2	0.21	39.0	37.6
	21-end	6.2	1.6	3.5	0.60	56.3	58.7

special topic

POLLUTION OF SURFACE WATER

There are three main pathways through which agriculture may pollute surface water: direct discharge of agricultural materials containing high amounts of organic matter which cause deoxygenation; run-off of nutrients following landspreading of slurry and fertilisers causing eutrophication; careless handling of chemicals (*pesticides, herbicides, sheep dip*) which are toxic materials. This topic deals with run-off which is governed by three main factors, i.e. infiltration rate of soil; rainfall; and slope.

INFILTRATION RATE

Infiltration rate of soil is affected by cropping practice (*arable > grassland > fallow*), water storage capacity (WSC) of the topsoil, and permeability of the subsoil. WSC of the topsoil varies greatly with the soil type - the WSC between field capacity and saturation is 30mm for a sandy soil, 20mm for a loam and 6mm for heavy clay soil. If the water table is high the WSC will be lower than these values. Where wastes are spread on frozen soils or on wet clay soils there may be virtually no infiltration and run-off may occur.

Permeability of the subsoil is also dependent on soil type with values varying from < 1mm per day in heavy clay soils to > 2000mm per day in gravel and sandy soils. There may be very little run-off from the soils with very rapid permeability and almost total run-off from those with very slow permeability after they have become waterlogged in late autumn/early winter.

RAINFALL

The most important factor in determining the degree of pollution which occurs following landspreading is the time interval which elapses before the first run-off occurs after rainfall. If the first run-off occurs within 48hrs of spreading, up to 40% of the N,P,K and organic matter (BOD) may be lost in surface run-off from impermeable soils. As the time between spreading and run-off increases, the concentrations of all parameters decrease as follows:

Time interval between spreading slurry @ 30m ³ /ha and run-off storm(days)	Concentration in surface run-off water(mg/l)			
	N	P	K	BOD
1	300	39	168	2400
7	41	21	52	100
14	10	11	16	50
21	8	7	12.5	6
amounts applied (kg/ha)	268	70	131	1311

It is worth noting that the BOD decreases rapidly. This is very relevant where agricultural wastes are spread on land to decrease their potential to cause pollution through deoxygenation. It is also worth noting that P concentration decreases more slowly than any of the other parameters. This is the reason why winter spreading poses a pollution threat in environmentally sensitive areas (*i.e. near lakes and reservoirs*).

Slope

Slope increases run-off volume. However, it has less effect than soil type.