

AGROMETEOROLOGICAL BULLETIN

The Weather of September 1988

Summary

High pressure was the major influence on conditions. For the most part the month was cloudy, cool by day and mild at night. Conditions were dry towards the south and east and wet towards the north and west.

Meteorological Situation

The opening days were dominated by a trough whose centre drifted up over Ireland to the west of Scotland; showers and westerly winds occurred from 1st to 3rd. A high pressure centre over northern Europe was the next influencing factor; Ireland being west of this high, very mild conditions and spells of rain in southerly winds affected the country from 4th to 7th. The Azores high was next to dominate; it first influenced conditions on the 8th and temporarily retreated on 9th, when extensive bands of humid air were advected in over Ireland and western Europe in the westerly airflow circulating on the northern side of the system. As the Atlantic high intensified again in mid-ocean, a northwest to north airflow set in on 10th. With continuing rise in pressure showers over the country had died out by 12th.

High pressure became the dominant feature over Ireland until 20th. The spell was largely dry but tended to be cloudy. With the decline of the high into Europe a series of troughs affected the country from the 21st to 23rd. Subsequently the circulation north of the Azores high continued to steer extensive mild and humid air masses and frontal troughs across the country in a westerly airflow. The final clearance of these humid conditions on 28th was followed by a cool northwest airflow and showers. The showers died out over the 29th as high pressure passed south of the country.

Precipitation

Amounts varied from well above normal in the north-west to well below normal in the south and east. Values ranged from 145% of normal at Clones to 30% at Cork Airport. Wettest spells occurred from 1st to 6th, and from 22nd to 29th. There was a major spell of weather favouring the spread of potato blight from 5th to 8th and on 10th/11th.

Temperature

Mean air temperature was well below normal, varying from 1.1°C below at Roche's Point to 0.0°C at Kilkenny. The negative anomalies were mainly due to low maximum values in all areas away from the south and east - anomalies in monthly minimum temperatures were positive reaching 1.1°C above normal at Kilkenny. Overall, temperatures were highest around the 8th and reached a minimum during the final days of the month. Air and ground temperature reached -0.7°C and 6.0°C respectively at Moorepark on 30th.

Sunshine and Radiation

Sunshine hours were quite varied being particularly low at Cahirciveen. Amounts varied from 107% of normal at Clones to 58% at Cahirciveen. The dullest spell occurred during the third week. Global radiation was 90% of average at Birr and Cahirciveen (where sunshine amounts were 85% and 58% respectively) and 98% at Kilkenny.

Wind

Strong winds with gale gusts occurred from 1st to 3rd, 12th/13th, 23rd to 28th and 30th in western areas.

NOTE: 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

SEPTEMBER 1988

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	7.7	-	5	4	18.1	11.2	14.6	-	7.4	3	0	102	-	48	-	4.0	3	0	-	-	39.0	-	1.8	-	-
	11-20	1.0	-	1	1	14.8	8.9	11.9	-	4.3	14	0	75	-	22	-	2.0	14	0	-	-	27.8	-	2.9	-	-
	21-END	33.2	-	8	7	15.3	8.6	11.9	-	0.5	30	0	76	-	26	-	-2.6	30	1	-	-	39.3	-	4.3	-	-
	MONTH	41.9	55	14	12	16.1	9.6	12.8	-	0.5	30	0	253	-	96	-	-2.6	30	1	-	-	106.1	-	3.0	-	41
Shannon Airport Co. Clare	1-10	21.9	-	7	4	17.6	12.1	14.8	-	10.0	3	0	104	-	48	-	5.0	9	0	14.7	-	22.3	-	5.3	3	-
	11-20	1.1	-	3	0	14.8	10.5	12.6	-	8.7	14	0	82	-	27	-	3.6	14	0	13.6	-	19.3	-	2.9	1	-
	21-END	57.9	-	8	8	15.5	9.5	12.5	-	2.5	30	0	82	-	29	-	-0.6	30	1	12.9	-	43.0	-	5.2	6	-
	MONTH	80.9	90	18	12	16.0	10.7	13.3	-0.4	2.5	30	0	268	91	104	83	-0.6	30	1	13.8	-0.8	84.6	75	4.5	10	47
Cork Airport Co. Cork	1-10	3.7	-	3	1	16.2	10.3	13.3	-	6.6	3	0	89	-	34	-	1.6	3	0	14.2	-	41.7	-	6.1	2	-
	11-20	0.0	-	0	0	14.0	8.9	11.4	-	7.0	14	0	70	-	17	-	2.7	15	0	13.2	-	33.4	-	3.9	2	-
	21-END	28.5	-	6	4	14.5	9.2	11.8	-	4.0	30	0	74	-	23	-	-0.1	30	1	12.6	-	43.5	-	6.7	5	-
	MONTH	32.2	28	9	5	14.9	9.5	12.2	-0.7	4.0	30	0	233	88	75	76	-0.1	30	1	13.4	-0.2	118.6	99	5.6	9	47
Fermoy (Coolnakilla) Co. Cork	1-10	20.2	-	6	4	15.9	9.4	12.7	-	3.1	2	0	83	-	31	-	3.5	3	0	-	-	35.9	-	N/A	-	-
	11-20	0.1	-	0	0	12.9	7.7	10.3	-	5.6	14	0	59	-	10	-	0.4	16	0	-	-	24.1	-	N/A	-	-
	21-END	45.6	-	10	8	13.9	8.4	11.2	-	3.5	30	0	68	-	19	-	-2.1	30	1	-	-	36.6	-	N/A	-	-
	MONTH	65.9	-	16	12	14.3	8.5	11.4	-	3.1	2	0	210	-	61	-	-2.1	30	1	-	-	96.6	-	N/A	-	N/A
Fermoy (Moore Park) Co. Cork	1-10	13.9	-	7	5	18.1	9.8	14.0	-	4.5	3	0	96	-	44	-	-2.2	3	1	-	-	36.3	-	3.5	-	-
	11-20	0.1	-	0	0	15.0	7.8	11.4	-	4.1	16	0	70	-	21	-	-0.6	16	1	-	-	35.2	-	2.2	-	-
	21-END	28.9	-	7	7	15.4	8.7	12.1	-	-0.7	30	1	78	-	28	-	-6.0	30	1	-	-	40.7	-	3.6	-	-
	MONTH	42.9	47	14	12	16.2	8.8	12.5	-	-0.7	30	1	244	-	93	-	-6.0	30	3	-	-	112.2	-	3.1	-	40
Roches Point Co. Cork	1-10	4.2	-	5	2	15.9	11.0	13.5	-	8.2	3	0	91	-	35	-	5.6	3	0	14.7	-	48.0	-	6.1	2	-
	11-20	0.0	-	0	0	14.6	9.6	12.1	-	7.3	16	0	77	-	23	-	4.2	16	0	13.9	-	35.5	-	4.1	2	-
	21-END	22.4	-	6	4	14.7	10.1	12.4	-	5.1	30	0	80	-	27	-	1.1	30	0	12.9	-	45.1	-	7.6	6	-
	MONTH	26.6	30	11	6	15.1	10.2	12.6	-1.1	5.1	30	0	248	85	85	71	1.1	30	0	13.8	-0.7	128.6	101	5.9	10	51
Glencolumbkille Co. Donegal	1-10	99.8	-	10	10	16.2	10.8	13.5	-	9.0	4	0	91	-	35	-	N/A	N/A	-	-	-	N/A	-	4.3	-	-
	11-20	10.4	-	5	3	14.7	10.2	12.4	-	8.7	15	0	80	-	25	-	N/A	N/A	-	-	-	N/A	-	3.2	-	-
	21-END	87.7	-	9	7	13.7	8.3	11.0	-	5.0	30	0	66	-	16	-	N/A	N/A	-	-	-	N/A	-	4.2	-	-
	MONTH	197.9	-	24	20	14.8	9.7	12.3	-	5.0	30	0	237	-	75	-	N/A	N/A	-	-	-	N/A	-	3.9	-	N/A

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TABLE 1 (CONTINUED)

SEPTEMBER 1988

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
Cahirciveen (Valentia Obsy.) Co. Kerry	1-10	18.4	-	10	6	16.2	11.9	14.0	-	10.2	2	0	96	-	40	-	8.2	9	0	14.7	-	13.6	-	5.3	3	-
	11-20	0.1	-	0	0	14.7	10.3	12.5	-	9.2	14	0	81	-	26	-	5.5	14	0	14.0	-	17.6	-	3.6	0	-
	21-END	39.6	-	9	8	14.8	10.2	12.5	-	3.1	30	0	81	-	28	-	0.0	30	0	13.3	-	33.3	-	6.5	5	-
	MONTH	58.1	45	19	14	15.2	10.8	13.0	-0.8	3.1	30	0	258	88	94	77	0.0	30	0	14.0	-0.5	64.5	58	5.1	8	39
Ardfert (Liscahane) Co. Kerry	1-10	25.5	-	6	5	17.3	11.3	14.3	-	6.7	9	0	99	-	44	-	1.6	9	0	-	-	38.6	-	-	-	-
	11-20	0.4	-	2	0	14.3	9.5	11.9	-	4.8	14	0	75	-	21	-	-0.6	14	1	-	-	22.8	-	-	-	-
	21-END	44.1	-	8	7	15.3	9.8	12.5	-	3.4	30	0	81	-	29	-	0.2	30	0	-	-	46.8	-	-	-	-
	MONTH	70.0	-	16	12	15.6	10.2	12.9	-	3.4	30	0	255	-	94	-	-0.6	14	1	-	-	108.2	-	-	-	-
Lullymore Co. Kildare	1-10	N/A	-	N/A	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A	-	N/A	-	N/A	-	N/A	N/A	-	-	N/A	-	N/A	-	-
	11-20	N/A	-	N/A	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A	-	N/A	-	N/A	-	N/A	N/A	-	-	N/A	-	N/A	-	-
	21-END	N/A	-	N/A	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A	-	N/A	-	N/A	-	N/A	N/A	-	-	N/A	-	N/A	-	-
	MONTH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A	-	N/A	-	N/A	-	N/A	N/A	-	-	N/A	-	N/A	-	N/A
Kilkenny Co. Kilkenny	1-10	9.8	-	6	3	18.5	10.8	14.6	-	6.5	3	0	102	-	48	-	2.6	3	0	14.8	-	34.6	-	4.1	2	-
	11-20	1.3	-	1	1	15.0	8.9	11.9	-	5.4	14	0	75	-	23	-	1.7	11	0	13.6	-	33.4	-	2.6	1	-
	21-END	40.2	-	8	7	15.8	7.9	11.8	-	-0.1	30	1	76	-	26	-	-4.3	30	2	12.5	-	39.9	-	3.8	2	-
	MONTH	51.3	63	15	11	16.4	9.2	12.8	+0.0	-0.1	30	1	253	95	97	85	-4.3	30	2	13.6	-0.5	107.9	94	3.5	5	45
Mooncoin (Silverspring) Co. Kilkenny	1-10	8.6	-	4	3	18.0	10.8	14.4	-	5.4	3	0	100	-	45	-	2.0	9	0	-	-	49.4	-	-	-	-
	11-20	0.0	-	0	0	15.3	8.8	12.0	-	4.6	19	0	76	-	24	-	-0.9	19	1	-	-	35.8	-	-	-	-
	21-END	25.4	-	8	5	15.7	9.4	12.5	-	1.9	30	0	82	-	31	-	-3.0	30	1	-	-	44.0	-	-	-	-
	MONTH	34.0	37	12	8	16.3	9.7	13.0	-	1.9	30	0	258	-	100	-	-3.0	30	2	-	-	129.2	-	-	-	-
Ballinamore Co. Leitrim	1-10	80.5	-	9	7	17.4	10.3	13.8	-	7.4	4	0	94	-	40	-	3.4	3	0	-	-	26.3	-	2.7	-	-
	11-20	7.8	-	3	3	14.0	8.8	11.4	-	6.8	17	0	70	-	17	-	0.1	17	0	-	-	12.9	-	2.1	-	-
	21-END	53.1	-	9	8	14.3	6.7	10.5	-	1.4	30	0	62	-	16	-	-3.5	30	3	-	-	43.3	-	3.1	-	-
	MONTH	141.4	135	21	18	15.2	8.6	11.9	-	1.4	30	0	226	-	74	-	-3.5	30	3	-	-	82.5	-	2.6	-	30
Ardee (Boharnamoe) Co. Louth	1-10	26.7	-	6	4	18.3	9.9	14.1	-	7.1	4	0	97	-	43	-	4.0	10	0	-	-	-	-	-	-	-
	11-20	2.6	-	2	1	14.7	7.8	11.2	-	2.7	14	0	69	-	19	-	0.1	14	0	-	-	-	-	-	-	-
	21-END	26.9	-	6	4	15.6	7.0	11.3	-	2.1	29	0	70	-	24	-	-0.1	30	2	-	-	-	-	-	-	-
	MONTH	56.2	71	14	9	16.2	8.2	12.2	-	2.1	29	0	236	-	86	-	-0.1	30	2	-	-	-	-	-	-	-

NOTES ON THE TABLES IN JANUARY ISSUE

TABLE 2 GLOBAL RADIATION

STATION	PERIOD	AMOUNT MJ/m ²
Malin Head Co. Donegal	1-10	85.76
	11-20	89.35
	21-end	83.43
	Month	258.54
Dublin Airport Co. Dublin	1-10	114.64
	11-20	86.61
	21-end	93.88
	Month	295.13
Cahirciveen (Valentia Obs.) Co. Kerry	1-10	85.41
	11-20	92.84
	21-end	88.64
	Month	266.89
Kilkenny Co. Kilkenny	1-10	114.84
	11-20	101.44
	21-end	92.36
	Month	308.64
Belmullet Co. Mayo	1-10	89.85
	11-20	87.74
	21-end	95.89
	Month	273.48
Clones Co. Monaghan	1-10	104.31
	11-20	72.46
	21-end	91.90
	Month	268.67
Birr Co. Offaly	1-10	108.30
	11-20	78.36
	21-end	88.67
	Month	275.33

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

STATION	PERIOD	SOIL MOISTURE (mm)			
		P.E.(mm)	Deficit	Accumulated Deficit	Surplus
Carlow (Oak Park) Co. Carlow	31-10	20.7	-	0	12
	11-20	12.6	12	12	-
	21-end	6.9	-	0	26
	Month	40.2	-	-	-
Kinsealy Co. Dublin	31-10	22.7	-	22	9
	11-20	12.1	11	33	-
	21-end	14.4	-	31	2
	Month	49.2	-	-	-
Cahirciveen (Valentia Obs.) Co. Kerry	1-10	3.1	-	0	30
	11-20	10.9	11	11	-
	21-end	2.6	-	0	35
	Month	16.6	-	-	-
Ballinamore Co. Leitrim	1-10	N/A	N/A	0	N/A
	11-20	10.5	3	3	-
	21-end	2.7	-	0	50
	Month	N/A	-	-	-
Glenamoy Co. Mayo	31-10	(-3.1)	-	0	104
	11-20	17.7	9	9	-
	21-end	23.6	-	0	48
	Month	-	-	-	-
Johnstown Castle Co. Wexford	31-10	18.2	-	0	15
	11-20	13.3	12	12	-
	21-end	10.5	-	0	17
	Month	42.0	-	-	-

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	15.4	14.5	12.7	-0.18
11-20	14.3		13.1	11.5	0.63	95.8	81.1
21-end	13.7		12.3	10.4	0.64	68.1	68.9
Mineral	1-10	16.2	14.0	12.0	-0.16	59.8	57.5
	11-20	14.5	12.3	10.7	0.16	202.0	112.6
	21-end	14.3	11.6	9.8	0.18	96.3	89.2

Notes on the tables in January issue

Weather and *Septoria tritici* of Winter Wheat

T.Keane, Meteorological Service

After King (1972), the criteria used for septoria infection are : (a) two out of three days totalling at least 10 mm with rain on the first day; (b) rain on three consecutive days totalling at least 5 mm; (c) rain on four consecutive days and relative humidity 90% at 09 hrs(GMT) on one of the days. Royle (1988) however postulated that *Septoria tritici* undergoes 'explosive' phases associated with splash and such splash events are not well correlated with rainfall amounts, duration or rate .

The concept of driving rain , long used in relation to stress on buildings etc.. may well reflect conditions associated with the splashing of rain-drops. Using the product of hourly values of wind speed and precipitation amounts summed over a given period (day / days), a force or pressure index may be obtained .

The table below gives King's criteria (K) and driving rain index (DR) at 10 day intervals for the season 1986 to 1988 at Kilkenny and Casement. While both reflect the general situation fairly well, it would seem that the driving rain shows some promise as an index to identify and quantify the more important weather-related septoria disease events. This is to be particularly noted in 1986.

Table: King's criteria (K), Driving rain (DR) ($m^2 hr^{-2}$) and *Septoria tritici* levels reported in Winter Wheat from ACOT weekly Tillage Crops Report (TCR). No. of hours > 45 $m^2 hr^{-2}$ * and max hrly event in brackets.

		Kilkenny		Casement		TCR **
		K	DR	K	DR	
1986						
April	1 - 10	0	0	0	221	Low
	11 - 20	1	252	3	509 (2,78)	Increasing slowly
	21 - 30	3	160	1	339 (2,79)	Fairly widespread (low)
May	1 - 10	4	543 (-,-)	2	331 (-,-)	Widespread (low)
	11 - 20	1	522 (3,73)	0	371 (2,62)	Widespread but on lower leaves
	21 - 31	3	490 (2,62)	0	959 (7,96)	Widespread low to mod
June	1 - 10	1	156	1	605 (6,131)	Widespread low to mod
	11 - 21	0	75	2	11	Increasing in some locations
	21 - 30	2	436 (2,92)	2	581 (4,131)	Continues to spread to flag leaf /ear
July	1 - 10	3	43	5	213	Still major disease
	11 - 20	1	4	2	136 (1,47)	Spread has slowed down
	21 - 30	3	121	2	525 (3,312)	NA (not available)
1987						
April	1 - 10	6	761 (3,373)	7	2900 (24,159)	NA
	11 - 20	0	19	0	68	NA
	21 - 30	0	22	0	74	A problem in some crops
May	1 - 10	0	19	0	117	Var.,high in some crops and spreading
	11 - 20	0	90	1	154	Widespread trace
	21 - 31	0	114	1	158	Generally low
June	1 - 10	7	624(1,132)	6	793 (3,100)	Widespread low to mod
	11 - 20	0	222	0	184	Increasing where not sprayed recently.
	21 - 30	1	112	3	394 (3,100)	Poses a threat
July	1 - 10	0	100	0	280 (3,101)	Low but severe in localised areas
	11 - 20	4	361(2,145)	4	270 (1,56)	NA
	21 - 31	0	0	0	44	NA
1988						
April	1 - 10	0	0	0	95 (1,93)	Low but occ. mod to high
	11 - 20	4	235	2	358 (3,97)	NA
	21 - 30	0	78	0	33	More widespread
May	1 - 10	3	341 (1,73)	4	764(9 ,-)	Wide variation
	11 - 20	0	29	0	310 (5)	Var., some crops still clean
	21 - 31	7	712 (4,104)	0	411 (2,58)	Inc. gen ,mod-sev. in some crops
June	1 - 10	2	351 (2,53)	1	289	Continues to increase,
	11 - 20	0	0	0	6	Variable
	21 - 30	0	148	0	27	Inc. where unsprayed > 4wks
July	1 - 10	4	394 (2,62)	3	454	Ear infection where poor control
	11 - 20	0	297 (1,58)	0	327 (1,48)	NA
	21 - 31	0	431 (298)	8	1312 (11,131)	NA

* Corresponds to minimum value of product of moderate wind speed and moderate rain or its equivalent.

** Report at end or immediately after each period is assigned to the relevant period given in the table. i.e. TCR Report for April 14, 1986 (Low) is assigned to April 1-10 etc..

References

King J.E (1972). Septoria progress, 1971. Open Conference of Advisory Plant Pathologists pp/207.

Royle ,D.J. (1988). The Place of Weather Factors in Developing Reliable Plant Disease Forecasts. In: Proceedings of Conference on Weather and Agriculture Dublin; AGMET (c/o Meteorological Service).