SOLAR RADIATION AND SUNSPOT DATA FOR NOVEMBER 1942

[Solar Radiation Investigations Section, I. F. HAND in charge]

SOLAR RADIATION OBSERVATIONS

Explanations of the tables and references to descriptions of instruments, stations and methods of observation, and to summaries of data, are given in the January 1942 REVIEW, p. 20.

During late November the pyrheliometers at Ohio State University, Columbus, Ohio; and Michigan State College, East Lansing, Mich., were standardized by a representative of the bureau and records from both of these stations will be included in table 2 beginning with the first of the new year.

The work at Ohio State University is under the direction of Prof. N. F. Childers of the Department of Pomology and it is anticipated that valuable correlations will be obtained between radiation receipt and the ripening of fruits. The coordinates of the station are as follows:

Latitude, 39°58′ N., longitude, 83°0′ W., altitude, 810 feet.

The pyrheliometric equipment is owned and operated by the U. S. Soil Conservation Service, in cooperation with the Michigan Agricultural Experiment Station, under the direction of W. U. Garstka. The primary purpose of the solar observations is to correlate radiation receipt with run-off in hydrological studies. The coordinates of the station are as follows:

Latitude 42° 44′ N., longitude 84° 29′ W., altitude 810 feet.

Latitude, 41°46′ N., longitude, 70°40′ W., altitude, 878 feet.

Eppley pyrheliometers and Leeds and Northrup micromax potentiometers are used at both stations.

TABLE 1.—*Solar radiation intensities during November 1942*

[Gram-calories per Minute per Square Centimeter of Normal Surface]

MADISON, WIS.

Date	Sun's zenith distance										
	7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air mass									Local mean solar time
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Nov. 3	2.87	------	1.11	1.25	1.39	1.55	1.33	------	------	------	3.15
Nov. 4	3.30	------	.86	1.01	1.14	1.30	------	------	------	------	4.19
Nov. 6	3.02	0.80	1.04	1.13	1.33	1.54	------	------	------	------	3.81
Nov. 11	3.02	.91	1.03	1.19	------	1.58	------	------	------	------	3.99
Nov. 13	2.74	------	------	1.21	------	------	------	------	------	------	2.16
Nov. 17	5.82	.90	.98	1.19	------	------	------	------	------	------	6.55
Means	------	.87	1.00	1.16	1.29	1.49	(1.33)	------	------	------	------
Departures	------	.00	+.01	+.01	−.02	−.04	−.01	------	------	------	------

TABLE 1.—*Solar radiation intensities during November 1942*

LINCOLN, NEBR.

[Gram-calories per Minute per Square Centimeter of Normal Surface]

Date	Sun's zenith distance										
	7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air mass									Local mean solar time
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Nov. 3	3.48	0.83	0.94	1.07	1.22	------	1.22	1.05	0.90	0.81	3.81
Nov. 4	6.55	------	------	------	------	------	1.14	------	------	------	8.86
Nov. 5	3.81	------	------	------	------	------	1.31	------	------	------	3.81
Nov. 7	4.57	------	------	------	------	------	.99	.62	.45	.37	[1] 5.38
Nov. 10	2.06	1.00	1.11	1.22	1.35	------	------	------	------	------	2.87
Nov. 11	3.15	.94	1.07	1.18	1.36	------	1.34	1.14	1.03	------	3.63
Nov. 13	3.02	------	------	------	------	------	1.22	1.12	1.00	.85	4.19
Nov. 14	3.48	.88	.98	1.14	1.29	------	1.29	1.05	.88	.70	4.37
Nov. 17	2.62	------	------	------	1.34	------	1.34	------	------	------	3.15
Nov. 18	3.15	.41	.62	------	------	------	------	.86	.64	------	5.38
Nov. 24	3.30	------	------	------	------	------	------	1.17	1.06	.92	5.82
Nov. 26	2.16	.83	1.02	1.21	------	------	------	1.24	1.11	1.05	3.30
Means	------	.82	.96	1.16	1.31	------	1.23	1.03	.88	.78	------
Departures	------	−.08	−.06	−.01	−.05	------	−.11	−.14	−.15	−.14	------

[1] Fairly heavy smoke throughout entire day.

ALBUQUERQUE, N. MEX.

Nov. 1	3.30	1.14	1.24	------	1.41	1.56	1.39	1.27	1.17	1.08	3.63
Nov. 2	4.17	1.03	1.12	1.25	1.40	1.55	1.40	1.21	1.14	1.03	4.37
Nov. 3	4.75	------	1.13	1.25	1.38	1.60	1.34	------	------	------	4.75
Nov. 4	6.27	.89	1.04	1.21	1.37	------	------	------	------	------	4.95
Nov. 5	5.36	------	------	------	------	------	------	1.19	1.05	.92	5.16
Nov. 6	4.95	.96	1.07	1.20	1.37	1.62	1.34	1.20	1.06	.95	5.36
Nov. 7	4.95	.97	1.06	1.21	1.36	------	1.37	1.22	------	------	4.95
Nov. 8	4.17	1.01	1.14	1.22	1.37	1.64	1.41	1.27	1.14	1.04	4.57
Nov. 9	3.63	------	1.13	1.19	1.29	1.53	1.42	1.33	1.18	1.08	3.81
Nov. 10	3.00	------	1.11	1.24	1.40	1.64	1.35	------	------	------	2.87
Nov. 11	2.87	------	------	------	1.43	1.66	1.40	1.24	1.08	.94	3.00
Nov. 12	2.06	------	------	------	------	------	1.42	1.29	1.18	1.07	2.49
Nov. 13	2.06	------	1.19	1.31	------	1.63	1.40	1.19	------	.90	2.16
Nov. 14	2.06	1.01	1.12	1.21	------	------	------	------	------	------	3.63
Nov. 17	3.63	------	------	------	------	------	------	1.23	1.10	1.01	4.75
Nov. 18	3.99	------	------	------	------	------	------	1.26	1.10	.98	4.75
Nov. 20	2.87	------	------	------	------	------	------	1.31	1.23	1.16	3.15
Nov. 21	2.87	1.08	1.17	1.28	1.40	1.49	1.41	1.19	1.07	.95	3.00
Nov. 22	2.74	------	1.20	1.33	------	------	------	1.30	1.18	1.08	3.15
Nov. 23	2.87	1.05	1.16	1.26	1.33	------	------	1.27	1.16	1.05	3.30
Nov. 24	3.45	1.07	1.18	1.29	1.39	------	1.42	1.25	1.11	.99	3.99
Nov. 25	3.00	1.06	1.16	1.25	1.35	------	------	------	------	------	4.17
Nov. 26	2.74	1.11	1.17	1.28	1.40	------	1.33	1.18	1.14	.92	3.00
Nov. 29	3.45	.99	1.12	1.24	1.37	------	1.38	1.26	1.13	1.01	3.15
Means	------	1.03	1.14	1.25	1.38	1.62	1.39	1.25	1.13	1.01	------
Departures	------	.00	.00	−.01	.01	−.00	−.01	.00	.00	−.01	------

*Extrapolated.

TABLE 2.—*Daily totals and weekly means of solar radiation (direct+diffuse) received on a horizontal surface*

[Gram-calories per square centimeter]

Date	Washington	Madison	Lincoln	Chicago	New York	Cambridge	Nashville	Twin Falls	New Orleans	Riverside	Blue Hill	Friday Harbor	Ithaca	Newport	State College	Put-in-Bay	San Juan u. v. below 3132 Å	East Wareham	Davis, Calif.
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*milli-cal.*	*cal.*	*cal.*
Oct. 29	274	60	94	50	245	235	5	165	379	402	268	278	202	258	153	50	171	268	275
30	313	67	166	91	219	273	194	279	346	366	281	76	251	311	270	116	192	311	325
31	252	316	305	227	193	283	6	131	--------	384	268	56	119	156	166	74	199	163	363
Nov. 1	263	50	240	86	109	101	244	112	--------	370	90	204	127	96	259	304	200	73	370
2	300	136	279	105	276	287	254	244	--------	352	295	150	168	307	179	170	341	302	333
3	262	293	310	220	191	20	270	40	--------	351	15	221	119	31	94	117	157	24	282
4	361	224	209	259	314	314	309	228	276	362	330	155	338	328	292	272	136	318	365
Mean	**289**	**164**	**229**	**149**	**221**	**216**	**183**	**171**	--------	**369**	**221**	**163**	**189**	**212**	**202**	**158**	**206**	**210**	**330**
Departure	**+43**	**−21**	**−5**	**−11**	**+8**	**+19**	--------	**−42**	--------	**+58**	**+2**	**+25**	**+31**	**−15**	**+33**	--------	--------	--------	--------
5	255	39	282	18	169	225	44	197	333	349	298	258	268	275	244	60	--------	312	341
6	97	216	150	163	83	107	15	252	402	339	118	30	27	154	32	262	209	136	325
7	131	156	243	212	211	216	31	129	408	315	232	227	289	220	259	242	274	211	312
8	218	154	47	155	78	61	69	54	400	336	79	88	170	130	24	167	346	136	81
9	221	20	56	15	233	230	223	259	362	336	254	48	289	282	158	83	267	287	342
10	55	183	290	39	86	136	197	266	280	350	130	207	46	89	52	76	255	118	329
11	300	266	288	247	256	176	232	285	442	325	188	196	108	268	144	174	276	217	291
Mean	**182**	**148**	**194**	**121**	**160**	**164**	**116**	**206**	**375**	**336**	**186**	**150**	**171**	**203**	**130**	**152**	**271**	**202**	**289**
Departure	**−41**	**−17**	**−38**	**−18**	**−27**	**−6**	--------	**−3**	**+71**	**+36**	**−9**	**+32**	**+17**	**−15**	**−18**	--------	--------	--------	--------
12	270	221	286	220	241	151	272	266	434	324	181	206	143	194	198	71	194	182	310
13	248	268	275	222	102	159	257	244	--------	305	161	21	124	146	115	110	276	116	202
14	292	240	274	210	270	228	256	90	--------	305	237	13	221	278	267	248	266	284	124
15	279	174	226	207	252	267	309	174	--------	111	277	133	271	282	254	248	219	297	285
16	276	76	214	131	192	188	265	140	307	297	198	35	227	230	214	232	238	217	65
17	261	160	233	100	170	201	256	29	121	310	204	133	141	224	121	34	158	230	50
18	204	206	226	155	204	80	216	76	--------	236	66	33	203	90	218	259	184	50	187
Mean	**261**	**192**	**248**	**178**	**204**	**182**	**262**	**146**	--------	**270**	**189**	**82**	**190**	**206**	**198**	**172**	**231**	**197**	**175**
Departure	**+60**	**+39**	**+37**	**+50**	**+55**	**+15**	--------	**−20**	--------	**−10**	**+30**	**−8**	**+76**	**+15**	**+43**	--------	--------	--------	--------
19	253	40	234	168	195	243	266	120	290	257	243	80	206	258	211	96	188	260	286
20	223	10	12	31	174	90	278	240	283	309	124	72	30	167	160	119	197	159	302
21	90	105	36	47	24	15	158	249	--------	323	8	80	24	13	30	55	--------	26	244
22	138	77	64	71	251	252	48	168	--------	302	243	45	238	239	231	131	173	238	268
23	42	65	226	15	93	214	42	205	389	291	240	126	146	245	17	23	--------	268	263
24	45	92	235	45	16	22	13	31	398	285	15	71	46	14	26	74	133	13	242
25	140	144	62	191	40	17	263	201	309	285	20	--------	26	11	12	142	78	19	277
Mean	**133**	**76**	**124**	**81**	**113**	**122**	**153**	**174**	**334**	**293**	**128**	**79**	**102**	**135**	**98**	**91**	**154**	**141**	**269**
Departure	**−50**	**−54**	**−73**	**−41**	**−27**	**−20**	--------	**+12**	**+80**	**+17**	**−23**	**−23**	**−21**	**−24**	**−37**	--------	--------	--------	--------
26	207	197	254	194	89	40	192	88	--------	284	34	28	157	49	95	58	144	69	239
27	283	132	85	189	233	23	294	71	--------	112	16	158	106	36	141	51	64	20	38
28	225	76	35	70	206	139	226	180	--------	250	186	41	202	234	95	73	--------	220	93
29	51	155	262	24	57	79	25	34	--------	270	82	82	30	75	20	26	--------	95	64
30	207	50	130	40	161	171	157	152	160	243	177	73	139	158	197	153	77	166	106
Dec. 1	45	217	131	117	10	63	7	53	299	272	80	24	24	87	8	16	97	93	234
2	134	225	214	209	160	112	198	166	360	260	80	147	76	126	129	120	187	70	173
Mean	**165**	**150**	**159**	**120**	**131**	**90**	**157**	**106**	--------	**242**	**94**	**79**	**105**	**109**	**98**	**71**	**116**	**105**	**135**
Departure	**−1**	**+24**	**−22**	**+21**	**+3**	**−47**	--------	**−45**	--------	**−8**	**−61**	**−5**	**+14**	**−55**	**−16**	--------	--------	--------	--------

ACCUMULATED DEPARTURES ON DECEMBER 2, 1942

	+357	**−3178**	**−9457**	**+4690**	**−3500**	**−5271**	--------	**+1400**	--------	**+11228**	**−11088**	**−1057**	**−686**	**−5614**	--------	--------	--------	--------	--------