

DISTRIBUTION OF WATER IN RICINUS

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The unequal distribution of water in the leaves of a plant, the greater amount being in the lower leaves, has been shown by Schweitzer ('89) for corn, Kraus and Kraybill ('18) for tomatoes, Bakhuyzen ('28) for wheat, Mme. Krasnoselsky-Maximov ('17) for *Zygophyllum*, and Maximov and Krasnoselsky-Maximov ('24) for *Helianthus* and *Atriplex*. Von Hoehnel ('78) was the first show a secondary maximum in the upper leaves.

This report concerns the distribution of water in actively growing plants of *Ricinus communis* L. in open soil on the campus of Stanford University, the experiments being conducted during September and October, 1933. Plants were of two sorts: (1) seedlings designated by "S" and (2) sprouts from a tree 20 cm. D.B.H. designated by "Sp" (table 1). To avoid errors in sampling, all leaves of a plant or sprout were collected in the field early in the morning during maximum saturation and placed in drying cans. The stems were cut into 20 cm. lengths beginning at the apex. The leaves and stems were dried at 103° C. The water content was calculated on a dry weight basis.

The data in Table 1 indicate that the water in the leaves is very irregularly distributed. A majority of plants with leaves near the middle tiers showed greater water content than the lowest leaf. Leaves just out of bud or emerging from it show the greatest water content.

Table 2 for the most part shows that the stems increase in water content from the base to the apex.

Since this plant has very large leaves, grows over a long period, and produces leaves many days apart, it is hoped that a study may be made of the environmental conditions under which each leaf grows in the field in relation to the very irregular distributions of water.

LITERATURE CITED

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TABLE 1. Percentages of Water in Leaves of Twenty Plants.
Reading from Top to Bottom the Water Content is Given of the Lowest Leaf to the Top Leaf.

No. of Leaf	Number of Stem																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	S	S	S	Sp	Sp	Sp	S	Sp	S	Sp	S	Sp	S	S	S	S	S	Sp	Sp	S
2	399	358	440	375	352	355	385	217	311	341	307	387	290	325	276	325	312	290	274	293
3	384	358	431	409	313	411	402	253	349	309	338	361	285	443	300	292	320	267	326	360
4	292	261	461	334	392	330	358	405	290	316	267	373	265	292	307	354	346	365	275	274
5	331	322	401	362	357	326	321	337	261	284	291	368	265	281	281	279	317	313	421	353
6	317	317	372	358	302	320	338	371	337	281	259	378	322	259	260	323	317	267	296	320
7	322	301	376	394	307	306	346	366	304	293	250	423	274	300	282	315	316	277	266	261
8	303	489	385	363	377	331	318	346	372	298	254	380	275	272	290	291	310	288	331	352
9	390	304	314	392	396	332	317	323	343	268	284	266	463	287	268	279	333	267	343	302
10	292	333	366	417	360	359	449	343	455	292	276	817	288	271	292	289	358	299	432	386
11	333	329	432	464	351	360	.....	355	472	365	275	.....	329	295	284	295	365	299	422	389
12	333	401	519	463	364	389	.....	469	1300	604	267	.....	440	307	280	351	520	327	452	428
13	324	565	.....	.....	.....	391	.....	562	.....	.....	310	.....	350	242	331	341	928	332	.....	471
14	301	.....	.....	.....	454	620	.....	.....	.....	.....	360	.....	421	481	301	367	.....	375	.....	.....
15	293	.....	.....	.....	480	.....	.....	.....	.....	.....	404	.....	488	500	361	380	.....	414	.....	.....
16	362	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	818	625	402	320	.....	.....	.....	.....
17	328	.....	.....	.....	.....	.....	.....	.....	.....	.....	867	.....	.....	.....	441	436	.....	.....	.....	.....
18	350	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	531	430	.....	.....	.....	.....
19	351	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1162	.....	.....	.....	.....

TABLE 2. Percentage of Water in Stems.
 Reading from Top to Bottom the Water Content is Given from the Bottom of the Stem to the Top in 20 cm. Lengths

No. of Stems	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
20 cm.	266	282	397	342	327	354	387	298	280	222	228	484	243	228	267	280	592	288	310	315
40 cm.	285	301	491	346	374	398	417	464	325	243	243	755	244	274	282	299	730	309	382	385
60 cm.	323	332	628	328	416	380	577	653	389	227	287	1092	255	343	262	336	.....	321	468	360
80 cm.	396	387	763	481	465	442	656	891	450	310	352	1406	266	404	235	431	.....	329	495	428
100 cm.	466	468	855	428	559	541	865	.....	594	254	429	.....	270	673	253	569	.....	385	.....	604
120 cm.	570	618	1176	506	916	755	.....	.....	901	272	539	.....	270	.....	255	1050	.....	531	.....	890
140 cm.	.....	863	.....	669	1184	1814	.....	.....	.....	313	759	.....	369	.....	291	.....	.....	804	.....	.....
160 cm.	.....	.....	.....	789	.....	.....	.....	.....	.....	363	.....	.....	409	.....	379	.....	.....	.....	.....	.....
180 cm.	.....	.....	.....	1140	.....	.....	.....	.....	.....	719	.....	.....	495	.....	421	.....	.....	.....	.....	.....
200 cm.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	850	.....	702	.....	.....	.....	.....	.....