

## THE CANADIAN HORTICULTURIST.

one of each pair was sprayed, and the other left unsprayed as a check plant. The six pair were then divided into three lots of two pairs each for treatment with Bordeaux mixture of different compositions.

Unsprayed Nos.	Sprayed Nos.	
1	2 (pear)	Sprayed with { 4½ lbs. cop. sulph. 2 lbs. lime, 40 gals. of water
3	4 (pear)	
5	6 (peach)	Sprayed with { 4½ lbs. cop. sulph. 4 lbs. lime, 40 gals. water.
7	8 (qu'ce)	
9	10 (pear)	Sprayed with { 4½ lbs. cop. sulph. —lbs. lime, 40 gals. of water.
11	12 (pear)	

A small atomizer, such as is used for throat troubles, was used, in order to ensure an even wetting of the surfaces of the leaves. Four successive applications were made on February 10th, 16th, 23rd, and March the 1st respectively.

On March the 10th, specimens of leaves corresponding in size, age, and position on the stem, were taken and put through the process of imbedding in paraffin, in order that sections of exactly the same thickness might be made of them. The plants were afterwards sprayed on March 16th, 24th, and April 5th; leaves were again selected in the same manner and imbedded by the same methods.

Transverse sections across the central part of the leaf were cut with a micro-tome; so that the sections were of the same thickness. No noticeable changes were observed in the foliage of the plants, until the time of the fifth application, when two and four which had been treated with the mixture containing the small amount of lime, appeared somewhat crumpled, but did not turn black. A critical examination and comparison of all the plants after the last spraying, revealed a marked difference between the color of the sprayed and the unsprayed plants. Those treated with an excess of lime mixture were decidedly greener than the unsprayed ones, while

those treated with the neutralized or second mixture also showed a deeper green, though not so marked as in the previous case. A microscopic examination of the leaves of Nos. two and four, which were treated with the unneutralized solution, failed to distinguish any gain in the amount of chlorophyll in the cells. So this experiment seemed to prove that the increased greenness of the foliage was in direct ratio to the quantity of lime used; and an examination of the sections of the leaves bore out the observations made on the external appearance. The most noticeable feature was the increase in the number of chlorophyll granules, both in the palisade cells and in the spongy parenchyma of the sprayed leaves. Thus the increase was in proportion to the amount of lime used.

The chlorophyll of the sprayed leaves was also a brighter green than that of the unsprayed.

In many places the treated leaves showed a third layer of palisade cells more or less continuous; in the untreated leaves, nothing more than a few scattered palisade cells were seen in addition to the usual double layer.

Measurements of the thickness of the leaves were made by means of the micrometer, from six to twelve of each leaf having been taken. The results in averages were as follows:

No. 1 (plum) unspr'd	141 mic'tres	} difference = 4.2 mms } loss fr spr'ing = 2.3%
No. 4 (plum) spr'd	136.8	
No. 3 (pear) unspr'd	177.6	} difference = 4.2 mms } g'n fr spr'ing = 2.5%
No. 4 (pear) sprayed	181.8	
No. 5 (peach) unspr'd	123	} difference = 9 mms } g'n fr spr'ing = 7.3%
No. 6 (peach) spr'd	132	
No. 7 (quince) unspr'd	169.8	} difference = 1.1 mms } g'n fr spr'ing = 16%
No. 8 (quince) spr'd	168.1	
No. 9 (pear) unspr'd	162.1	} difference = 12.1 mms } g'n fr spr'ing = 7.5%
No. 10 (pear) sprayed	174.2	
No. 11 (pear) unspr'd	163.2	} difference = 18 mms } g'n fr spr'ing = 10.7%
No. 12 (pear) sprayed	186.2	

It might be explained that in the case of the quince, No. 7 was a much more vigorous plant than No. 8.

While the wide variations shown are