

Pectin in Avocado Leaves

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When pectin is mentioned, it usually is associated with fruit problems. Recently it was shown¹ that citrus leaves and bark contain large quantities of total pectin. The part that pectin plays in the nutrition or economy of the vegetative portion of the tree is not understood. It is known that in apple leaves² pectin is wholly a cell wall constituent.

In connection with preliminary studies of the pectin content in citrus leaves and bark¹, a number of samples of avocado leaves collected at various times from healthy trees and from trees affected with tipburn were also included (table 1).

Table 1 shows the wide range in the percentages found in avocado leaves. Many of the percentages occur in the same range as those for citrus and walnut leaves, but many are distinctly lower. The collection of avocado leaf samples was not extensive, but the limited data suggest that leaves affected with tipburn usually contain high percentages of pectin. It is not known whether pectin is a measure of the age of avocado leaves or whether chlorine is a factor in the aging of the leaves.

The pectin content of walnut leaves differs but little from that of citrus leaves. The results for the healthy leaf samples in table 2 indicate that the percentages of total pectin were lowest in the samples from the trees in unfertilized soil. Only in 7 of the 12 comparisons did the healthy leaves contain higher percentages than the mottled ones.

On February 3, 1933, several walnut bark samples were collected from a 15-year-old tree growing near the plots of the Rubidoux fertilizer trials. The percentage of calcium pectate found in the dry matter of the bark taken 3 feet above the soil was 9.54; and that at 6 feet elevation, 9.61. This bark at the time of sampling contained much less pectin than did the bark samples of citrus.

There are various forms of pectin in fruits, and it would be of interest to know what forms occur not only in the fruits but also in the leaves and bark. Studies with leaves of various ages collected at the same time from different varieties growing under the same soil and cultural conditions would supply useful data because of the relation of pectin to acids, sugars, and water. The present paper is concerned chiefly with showing that the leaves of avocado trees may contain considerable pectin.

TABLE 1
Content of Total Pectin in the Dry Matter of Avocado Leaves

Variety	Collected	Conditon of leaves	Calcium pectate per cent
Lyon	La Habra, 1-12-27	healthy	4.28
Taft	Riverside, 3-10-28	healthy	7.14
Spinks	Riverside, 4-30-30	healthy	7.68
Puebla	Riverside, 4-28-31	healthy	7.94
Fuerte	Riverside, 3-10-28	healthy	8.48
Benik	Riverside, 4-30-30	healthy	9.82
Blake	Riverside, 4-30-30	healthy	11.92
Fuerte	Culver City, 1-25-28	badly tipburned	13.69
Fuerte	Riverside, 12-9-27	healthy	14.32
Taft	Riverside, 3-10-28	badly tipburned	15.14
Fuerte	Riverside, 3-10-28	badly tipburned	15.73
Puebla seedling	Riverside, 4-20-31	healthy	16.26
Puebla	Riverside, 3-10-28	badly tipburned	16.53
Puebla*	Riverside, 4-13-28	badly tipburned	17.53
Fuerte	Riverside, 3-10-28	badly tipburned	18.17
Fuerte	Riverside, 4-30-31	badly tipburned	21.28

*Flowers, with pedicels but no stalks.

For purposes of comparison with trees that lose their leaves each year, data are also included for walnut trees (table 2).

TABLE 2
**Total Pectin (Estimated as a Percentage of Calcium Pectate) in the Dry Matter
of Healthy and Mottled Walnut Leaves Collected at Moreno,
California, on September 25, 1931**

Tree row	Leaves	
	Healthy	Mottled
3	9.09*	9.93
4	17.74	11.88
5	15.19	18.92
6	16.18	16.62
7	15.38	13.60
8	14.22	12.16
9	13.09*	9.67
10	20.22	13.26
11	15.44	11.53
12	14.06	10.42
13	14.56	15.53
16	9.00*	18.01

*No soil treatment; all other rows in treated soil.

¹Haas, A. R. C. Pectin in vegetative portions of citrus trees. (In press.)

²Tutin, F. LX. The pectin content of normal and "silvered" apple leaves Biochem. Jour. 19: 414-415, 1925.