

Cold Hardiness of Avocados during the January 1962 Freeze

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During the freeze of January 9-12, 1962, 34 strains were growing in the avocado test nurseries at the Texas Agricultural Experiment Station near Weslaco, Texas. These strains were composed of three avocado races and their hybrids. Part of the avocado strains were named varieties from California and Florida, and part were selections made in Texas and Mexico. All of the strains were being tested for their adaptability to the Valley.

Table 1 shows the number of hours the temperature was at or below 32° on the Texas Agricultural Experiment Station. Since the avocado test plot is within two hundred yards of the weather station, the avocado trees were subjected to about the same temperatures.

Table 1. Duration of freezing temperatures at the Texas Agricultural Experiment Station weather station near Weslaco, January 9-12, 1962.

<i>Temperature</i>	<i>No. of hours below indicated temperature</i>
32°	65.0
31°	57.0
30°	54.5
29°	51.0
28°	40.0
27°	30.0
26°	22.0
25°	16.0
24°	8.5
23°	8.2
22°	8.0
21°	7.0
20°	7.0
19°	4.0
18°	4.0
17°	0.7
16°	0.5

A record was made on degree of freeze injury of each strain in the plot and on the status of growth at the time of the freeze. Table 2 gives the freeze injury information on the various strains represented in the test plot.

Table 2. Cold injury to avocado trees in Experiment Station test plot four months after freeze of January 9-12, 1962.

Strain	Avocado race	Age of tree in years	Growth status at time of freeze	Amount of cold injury ¹
Zutano	Mex. x Guat.	3	Blooming	5
Chapeno	Mex.	6	Blooming	3
14/8	Mex.	9	Blooming	4
Hart Seedling	W.I.	2	Dormant	5
Santa Engracia	W.I. x Mex.	12	Blooming	3
McRill	W.I.	12	Dormant	5
Hannam	Mex.	12	Blooming	1
Haven	Mex.	12	Blooming	1
Lula	W.I. x Guat.	12	Dormant	5
Booth 7	Guat.	12	Dormant	5
7/2	Mex.	11	Blooming	2
Prior Seedling	Mex.	7	Blooming	1
14382	Mex.	12	Blooming	2
Austin	Mex.	4	Blooming	5
J-12	Mex.	1	Dormant	5
14369	Guat.	12	Dormant	5
1/18	Mex. x W.I.	11	Blooming	1
Hass	Guat.	4	Growing—no bloom	5
Castro 2	Mex.	11	Blooming	2
R #1	Mex.	11	Dormant	2
Amidon	Mex.	8	Blooming	3
Alanis 3	Mex.	11	Blooming	2
W #1	Mex.	11	Blooming	1
Paz #4	Mex.	8	Blooming	2
29/9	Mex. x W.I.	9	Blooming	4
10/2	Mex.	9	Blooming	2
Paz #3	Mex.	8	Blooming	3
Pancho	Mex.	6	Blooming	2
5/2	Mex.	8	Blooming	4
San Juaneno	Mex.	4	Blooming	5
Chamano	Mex.	6	Blooming	3
Gonzales	Mex.	6	Blooming	4
Molina	Mex.	6	Blooming	4
Garza	Mex.	6	Blooming	4

¹ Legend

1. Secondary wood frozen, main framework limbs alive.
2. Main framework limbs dead halfway to crotch of the tree,
3. Main framework limbs dead to just above crotch of tree.
4. Top completely dead, tree alive just below crotch of the tree.
5. Tree dead to the soil bank or ground if unbanked.

All strains of West Indian, Guatemalan, and hybrids between the two races were killed to the soil banks. Trees of the Mexican race and some of the Mexican hybrids showed a wide range of cold tolerance; some showed only secondary wood damage, others were frozen back to the soil bank. Within the Mexican race, trees up to six years of age were less cold tolerant than trees over six years of age. At the time of the freeze, most of the Mexican-race trees were in bloom, which should have caused the trees to be fairly cold tender. This indicates that the degree of dormancy has less effect upon the hardiness of avocados than with many other plants.

An examination of the avocado test plot in May showed that all of the strains except two were alive above the bud union. Most of the trees have made three feet or more growth since the freeze and probably will produce fruit in 1963.