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THE AVOCADO IN CENTRAL AND NORTHERN CALIFORNIA

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Avocado culture in central and northern California and in the coast valleys is still more or less in the experimental stage, although the success of small plantings in many sections is encouraging and conducive to further and more extensive trials. Some of the experiences of growers in a few widely separated districts may be of interest.

The presence of large seedling trees of the Mexican type, ten years old or more, at Visalia, Los Gatos, Berkeley, Napa Soda Springs, and Youngville, and two of the Guatemalan type at San Luis Obispo, was noted in the 1915 report of this Association. The trees at Los Gatos, Visalia and Napa have borne fruit for several seasons. Budded trees of the Pomona, Fowler, Blake, Harman, and Wagner, produced fruit in 1916 in the interior valleys, and scores of trees are blooming heavily this season. At Oroville a large tree of the Mexican type grown from a seedling started in 1905, bore 1 fruit at nine years, 2 at ten, and 5 at eleven years of age. The tree is now 25 feet high and has proven perfectly hardy. At Sunnyslope in Butte County such varieties as the Harman and Northrop have been grown and propagated for several years.

The success of the avocado in the middle of the Sacramento Valley away from the foothills is questionable. In the spring of 1914 Mr. Skinner, a member of this Association, planted 140 high-land Mexican seedlings in orchard form among standard prune trees at Yuba City. The following winter about one-half were frosted on account of their tender growth due to late irrigation. Budded trees of the following varieties were also set out early in 1914: Chappelow, Sinaloa, Walker, Meserve, Dickinson, Taft, Queretaro, Harman, Atlixco, Dickey, and Ganter. These came through the winter without serious injury although they were not covered or protected. During the winter of 1915-16 the minimum temperature was 22°, but the cold was not prolonged. The Taft, Dickinson and Dickey frosted most, while the Walker and Ganter had only the tender branches injured. Four inches of snow fell after the heaviest freeze; this settled on the branches of one tree near the house and broke 4 feet out of the top, leaving 5 feet of trunk and branches. The Sinaloa trees showed no signs of frost injury.

During 191 6 a number of other trees representing twenty-two varieties, were set out, while neighbors in town planted nine more; there were altogether forty different varieties in the vicinity for testing. The winter of 1916-17 was unusually severe as shown by the following report by Mr. Skinner on January 1, 1917: "It has been freezing steadily for the past six weeks and I could not tell just what would become of my avocado trees. I have five large seedlings, 8 to 10 feet high, that will come through in good shape; all the rest are frozen to the ground, or at least down to the protectors around the trunks. One Sebastian and one Knowles which were in a more protected place look better. The thermometer ranged from 21° to 26°, and for a long time every morning the ground

would be frozen until noon, and a cold north wind often blew for days. The trees will likely start up strong from the roots and make new tops." A later report states that: "The avocado trees stood more freezing than any of the citrus trees of the same age. The latter were all killed and are not starting from the roots; the avocado trees are sprouting out, some at 3 to 6 feet high, others near the ground."

The trees in town came through in much better shape. One grower wrote that the Chappelow, Northrop, Harman, and a couple of seedling trees were blooming heavily the first of May. He believes that some of the hardy varieties can be grown in that section, although they should not be tried as a commercial proposition. His place is undoubtedly much warmer than it would be a mile or more away from the river and away from buildings which serve as a protection.

On the Requa Ranch at Orland 60 Northrop trees planted in 1916 were uninjured by the cold of the following winter. All with one exception, were protected by burlap shelters, and it came through in about as good condition as those which were protected. The wind in fall and winter seems to be the limiting factor for avocado trees at Orland and the advisability of planting Guatemalan types, the fruit of which hangs on the tree over winter, is doubtful. Planting near buildings, windbreaks, or among other evergreen trees may obviate this difficulty to some extent.

Near Dunnigan, Yolo County, trees of several varieties were planted in March 1916, but all were burned by the sun because of disregard of the instructions to protect them with sacking. Three Harman trees seemed to show most vitality from the start and survived the winter in good shape.

Reports from Sacramento County are so far not very encouraging. Northrop, Taft and Ganter trees in the Carmichael Colony were all badly injured with the exception of one Northrop tree from which the burlap covering was blown by the wind. This tree, though unprotected, proved the hardiest of all and stood the frost better than the rest. At Folsom one Taft and one Ganter tree, planted in the spring of 1913, were about 5 feet high and well branched by 1916, but the past winter both were frozen back some, the Ganter more than the Taft, which was protected by other trees and vines. Three more Taft trees and one Ganter planted a couple of years later froze to the ground during the winter of 1916-17.

One grower at Fairoaks is of the opinion that the avocado tree will not do well in that section, as it does not seem to endure the frosts or the heat. Several years ago he planted 100 Mexican seedlings which lived through the winter with protection but died the following summer even though pains were taken to shade them. Two years ago 100 more plants were raised from seed, but they were all killed during the winter of 1916-17 with the exception of three plants, one Harman, one Chappelow and one seedling, which stood near a building and came through unprotected. The seedling is very hardy and was uninjured by the severest frosts, but it is very slow growing. It is now three years old and full of bloom. The Harman is two years old and is also in bloom.

At Lincoln in Placer County there is a Harman tree now three years old, which is reported to have escaped all frost injury although some of the surrounding orange trees of the same age were killed by the frosts of -last winter. At Newcastle in the same county, however, budded trees of several varieties both Mexican and Guatemalan, were

killed during the past winter. Several Mexican seedlings, however, escaped and were blossoming heavily in April. These trees were in a fairly low, unprotected locality and the test is probably not a fair indication of the possibilities of the region for avocado trees.

In many of the protected valleys and hillsides of the San Francisco Bay region, orange and lemon trees laden with fruit are a common sight and thriving lemon orchards are by no means uncommon. In some of these places the possibilities of avocado culture have already been recognized and many thriving trees are to be found. One of the most extensive and promising plantings is on the Ostrand place, two miles east of Walnut Creek. During the past winter a self-registering thermometer showed a minimum temperature of 30°F. at the house near which most of the trees are planted. Some of the trees are now one year old from planting, while others were set this spring. They include such varieties as Fuerte, Lyon, Blakeman, Taft, Murrieta, Spinks, Linda, Rey, and Queen. A Harman tree two years from planting was in full bloom the first of May. At a near-by place on the floor of the Ignacio Valley, a Northrop tree passed through the winter uninjured by a minimum temperature of 220° and was full of bloom May 2nd. A Taft tree near-by was frozen back to the ground, while one Fuerte and one Sebastian were seriously injured but were sprouting from the trunks and main branches.

In the Santa Clara Valley proper, attempts to grow the avocado tree have been on the whole discouraging. One fairly old seedling on Judge Leib's place near San Jose, has managed to survive but has been frozen nearly every winter and the injury during the past winter was especially severe.

Along the western foothills, however, greater success has been attained as the bearing tree of the Mexican seedling at Los Gatos shows. Most of the budded trees planted have been of the Harman, which at Saratoga was only slightly injured at 26°. A number of varieties including the Taft are growing successfully at Los Altos.

Small plantings of the avocado are found in the San Joaquín valley, not only in nearly every citrus section, but also on the floor of the valley. Along the foothills in protected situations, thriving trees already show much promise of future commercial success, but in the center of the valley only a few of the most hardy trees may be expected to succeed. One attempt to grow a Northrop tree at Oakley was unsuccessful but at Elk Grove where the winters are not so severe, the results were much more encouraging. Mrs. Gage of Elk Grove has 11 trees growing out of 15 originally planted. The trees lost were of the Taft variety; there is one Chappelow, while the rest are Harman. She reports that she firmly believes the avocado can be grown successfully in the valley by giving some protection during the first winter or two. Three of the trees are three years old, about 14 feet high and well branched. They stood the cold much better than the Villa Franca and Lisbon lemon trees, as the branches of the avocado trees had to be cut back 2 to 4 inches, and the lemon trees 2 to 4 feet.

It may surprise some to know that there is now a railroad station in California bearing the name Avocado. This is in the foothills of Fresno County, on a branch line of the Santa Fe running northeast from Reedley, where the Kirkman Nursery has an experimental planting of avocado trees. About two dozen varieties were planted during the month of May 1913, in sandy nursery soil, citrus stock being grown on the land at the same time. In 1916 the Fowler, Harman, Northrop and Blake matured fruit, the

Fowler being exceptionally fruitful.

The writer visited this planting on April 4th, 1917, and made the following notes as to the condition of trees observed:

HARMAN: Some trees in full bloom, others in bud, showing practically no frost damage.

NORTHROP: Trees mostly in bud, showing practically no injury.

MESERVE: Badly injured, branches up to 1 inch in diameter being killed.

WAGNER: Injured; branches up to one-half inch in diameter killed.

CHAMPION: Small tree, practically killed; surrounded by orange and lemon nursery trees uninjured.

BLAKE: In full bloom; very little injury.

FOWLER: Some trees in full bloom, some in bud, uninjured.

Another valuable variety test is that being made at Navelencia, Fresno County, by Mr. R. P. Mathews, who planted trees on five acres of dry bog soil in 1915. The list of varieties includes: Wagner, Taft, Sharpless, Canyada, Fuerte, Queretaro, Sinaloa, Puebla, Northrop, and Harman. He has found the Taft and Sharpless the least hardy in the district. The most satisfactory growers are the Queretaro, Canyada, Fuerte, and especially Sebastian, which is wonderfully vigorous. The trees are on an especially warm slope where drainage is good. Mr. Mathews thinks it useless to attempt to raise the Guatemalan types on the flats of the San Joaquin Valley. The Sebastian, Harman, and Northrop, however, should thrive wherever the orange tree thrives. During the winter of 1916-17 the Puebla, Fuerte, and Sebastian proved most hardy and the Taft most tender.

Ten miles east of Porterville in the south Tule River foothills, Mr. Frank Frost has some seedling Mexican trees which are doing well. One tree, which bore fruit in 1916, has been named the Alpine, as the drooping branches turn up at the tips, giving it somewhat the appearance of a pine tree. The fruit is reported as 3 to 4 inches in length and 2 to 3 inches in diameter; seed, exceptionally small; season, October to December. Tree about 15 feet high; planted in 1912.

These reports from various sections indicate that many varieties of avocados can undoubtedly be grown in the more protected places of the interior, especially along the foothills. In conclusion I wish to repeat the statement made in California Station Bulletin 254, published just two years ago: "Those who contemplate avocado planting in untried localities should proceed cautiously and not plant any variety extensively unless they are willing to assume the risks of the pioneer."