

Evaluation of Lemon Selections for the Desert

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By acreage, lemons are the second-most important citrus crop grown in California after navel oranges. Lemons are grown in the coastal regions, in the San Joaquin Valley, and in the desert. Each of these regions has a distinct climate that affects tree growth, fruit maturation time and fruit quality.

Desert-grown lemon trees grow faster, but the trees are more adversely affected by the heat, thus fruit abscission can be greater and yields per acre may be lower. Fruit grown in the desert typically mature sooner than those grown in the other areas, allowing them to take advantage of high late- summer and fall prices, but may also have thicker peel and lower juice content.

Lemon selections grown in the desert must ultimately meet the demands of the marketplace, and produce acceptable returns for the grower. This project is designed to evaluate ten lemon selections under desert conditions. The objectives of this project are to provide the industry with information on the tree growth, yield, packout, and fruit quality characteristics for selected lemon varieties in the California desert.

For this 10-year trial, we have planted the following 12 selections, all on *Citrus macrophylla* rootstock, at the Coachella Valley Agriculture Research Station in Mecca, CA:



Figure 1: Young lemons planted at the Coachella Valley Agriculture Research Station, Mecca, CA.

Limoneira 8A Lisbon (as a standard) - A vigorous selection originating from the Limoneira Ranch, Ventura County, CA.

Allen Eureka (as a standard) - The most common and popular Eureka selection planted in California.

Seedless lemon – This variety was imported sometime before 1985 from Lasscock’s Nursery in South Australia as “Seedless Lisbon”. The genetic markers of this selection have twice been tested to determine whether it belongs to the Lisbon or Eureka group, but the current data it is still not clear.

Femminello Santa Teresa – A selection of Femminello Ovale that was imported in to California from Sicily in 1959.

Corona Foothills – Originates in Corona, CA. This selection purportedly originates from Villafranca, has fruit that is indistinguishable from Eureka, but has a winter distribution of the crop, similar to Lisbon.

Limonero Fino (Fino 49) - The chief winter lemon of Spain.

Limonero Fino Largo (Fino 95) – Another promising selection originating from dooryard trees in Murcia, Spain (Planted in April 2007).

Walker Lisbon - A vigorous selection from California that is performing well in Arizona.

Messina – Purportedly early lemon selection from Italy.

Interdonato – Probably a lemon-citron hybrid, originating in Italy in 1875.

Yen Ben – A Lisbon-type selection originating in Queensland in 1930.

Variegated Pink Fleshed Eureka – A Eureka lemon variegated sport that was selected by A.D. Shamel about 1930.

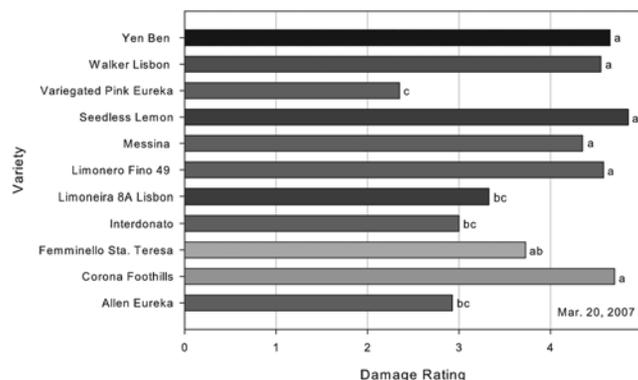


Figure 2: Freeze damage ratings for lemon varieties on 3/20/07. Bars with letters that are the same indicate no significant difference in ratings between varieties.

The January freeze caused quite a bit of injury to the trees in this project. Temperatures at the experimental site dropped to 23°F, and there appeared to be differences in the degree of freeze injury due to variety. In response, we developed a freeze injury rating based on a 0-to-5 scale, where trees with more damage received a lower value, and in February and March we tried to quantify the degree of damage. That information for March 20, 2007 is shown in Figure 2.

Among all the selections, Corona Foothills, Femminello Santa Teresa, Limonero Fino 49, Seedless Lemon, Messina, Walker Lisbon and Yen Ben Lisbon had the best ratings, Allen Eureka, Limoneira 8A Lisbon and Interdonato had moderate ratings, and Variegated Pink Eureka had the lowest rated variety. Compared with the others, the performance of Allen Eureka and Limoneira 8A Lisbon was surprisingly poor. Eight of the original 240 trees died and could not be replaced.

In October 2007, we returned to the site to view the continued recovery of the trees and to collect canopy volume measurements. Virtually all of the 232 trees that survived the freeze had recovered completely, and surprisingly, six trees had fruit. We expect most of the lemon trees to have some yield in 2008.

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