

given complete control, and invasion by native grasses has been rapid.

Conclusions

These experiments, comparing Picloram control data from several environmental conditions and vegetation types in southern California, lead to the conclusion that Picloram has certain advantages over standard brushkillers: (1) Careful observation of plant condition following foliar application indicates that leaf kill occurs more slowly than with brushkillers. This delay may account for greater translocation of Picloram. Foliar applications require total coverage while translocation may not be sufficient to kill the entire plant if one or two branches escape contact. On the other hand, soil applications appear to be absorbed readily and distributed throughout the plant. Greatest consistency in total plant kill has been obtained with soil applications. (2) Experience of other workers and observations from these studies indicate that Picloram has a relatively long residual life in the soil which may prove a distinct advantage in brush control, since retreatment to control sprouting has been an expensive and time-consuming maintenance problem. (3) The relative tolerance of grasses to Picloram allows the invasion of native grasses or the seeding of introduced grasses to be accomplished. A reasonable stand can probably be achieved during the season following treatment.

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ENCORE and

... *two new mandarin hybrids with unusually late seasons of use*

Encore and Pixie are two new citrus hybrids, suitable for eating out of hand in late spring to summer. Both were originated at the University's Citrus Research Center in Riverside and evaluated primarily in the Riverside area.

MANDARIN VARIETIES with main seasons of use extending from as late as June to August are rare in all citrus areas of the United States. 'King,' which is perhaps a tangor, is one of the latest maturing such varieties. 'Murcott,' a variety of uncertain parentage, is unusually late in season in both Florida and California. Where the spring months are cool, the 'Kara' mandarin is sometimes good in flavor until July. Very late mandarin types have the disadvantage that their fruit must remain on the tree through the winter and spring. This fruit also meets severe competition from summer-ripening fruits of many other species. Nevertheless, the very scarcity of such citrus types makes them of interest both in the market and for breeding.

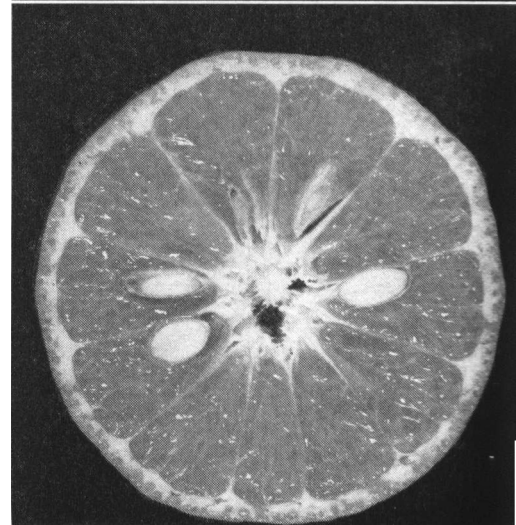
Citrus Research Center

The two new hybrids, 'Encore' and 'Pixie,' originated at the University of California Citrus Research Center from seed obtained by Howard B. Frost. Both have unusually late seasons of use. They have been evaluated at Riverside, and the descriptions apply to this climatic area, but some information on 'Pixie' has been obtained from other locations. Neither hybrid has all the characters which make for an ideal variety, but each has an unusual combination of qualities. Both are of good flavor and suitable for eating out of hand. 'Pixie' is almost completely seedless in all locations tested.

'Encore' is a cross of 'King' by 'Willow Leaf' mandarin. A budline was maintained at Riverside for some years, after which detailed studies of the hybrid were begun about 1954. The fruit ripens at

Riverside from May to June, and usually is good until August or September. Fruit shape is oblate, with little-to-no neck. The rind is thin and smooth, except for a slight pebbling at the base. A small navel opening is usually present. Overall rind color is a yellow-orange that is deeper at the blossom end than at the stem end. The fruit peels easily, with very little albedo adhering to the flesh.

Encore mandarin is oblate, easy to peel, rich flavored and good until August at Riverside.



PIXIE

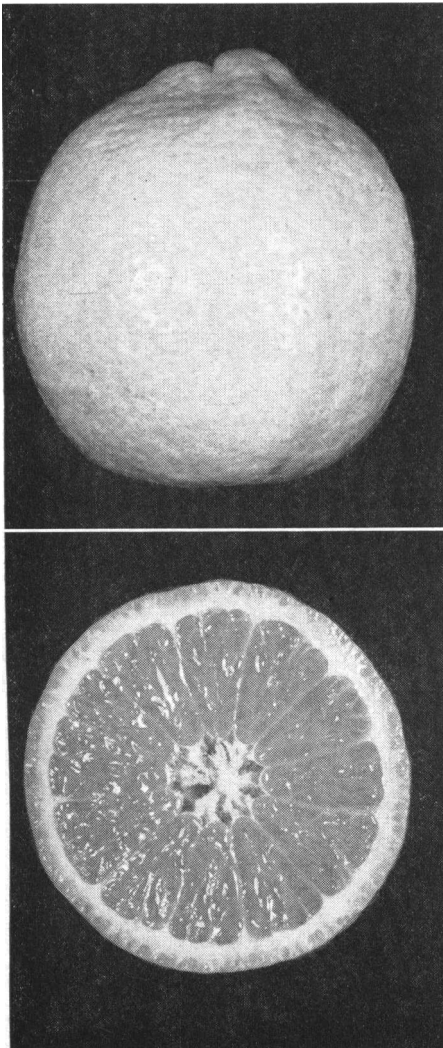
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The core is hollow from early maturity, but the fruit is firm with practically no rind puffing. The flesh is tender, yet firm; juice vesicles are small. Flesh color is deep orange. Total soluble solids are high to very high; acid is moderate to slightly low, but the fruit may taste tart until midsummer. Tests in several years (see table) show that soluble solids and acid were maintained at a satisfactory

PIXIE mandarin is seedless, easy to peel. Season April to July at Riverside (photos natural size).



level until July or August. Tests with 'King' indicate that levels of solids and acid are similar to those of 'Encore,' but 'King' fruits usually become soft and stale-tasting earlier than those of 'Encore.'

Seeds in 'Encore' are numerous and usually plump and rounded, but sometimes empty. Cotyledons are usually white. The seeds appear to be mono-embryonic. The tree is moderately vigorous with many slender branches and few thorns. Leaves are slightly shorter and narrower than 'King.' The bud union on sweet orange rootstock has been smooth; on 'Troyer' citrange there is moderate undergrowth of scion at six years from budding. Bearing habit has been somewhat alternate. The fruit is borne singly or in two's or three's, not in large clumps.

'Pixie' is a second-generation hybrid (or possibly a self) from open pollination of an F₁ hybrid between 'King' and 'Dancy' tangerine. Fruit of 'Pixie' ripens at Riverside in April to May and remains good into July. Fruit size is small to medium and fruit shape is variable—oblate to somewhat elongate. There is sometimes a neck.

The rind is rather thin but not fragile; rind surface is grained-to-pebbled, with occasional furrowing at the stem end. The rind puffs very little. There is no appreciable navel structure. Rind color is yellow-orange to pale orange, and full coloring is slow to develop in some seasons. The fruit peels easily without dripping juice, and little albedo adheres to the flesh.

The core is hollow, but the fruit can be firm into summer. Segment membranes are easy to separate and the flesh is fine-textured. Flesh color is medium orange. Soluble solids are moderate to high, and acidity is rather low (see table). The taste is pleasant, milder than 'King' by early summer, but the flesh sometimes becomes dryish by July.

Seeds are very rare, often only one or two in a sample of 20 fruits. Mixed citrus plantings favorable to cross pollination have never caused seediness in 'Pixie.' Examination of the flowers in 1964 showed normal-appearing stigmas and styles, but abortion of mature pollen grains, from four trees, was 95% or greater.

The tree is erect to somewhat spreading, and is unusually vigorous for a mandarin type. Branches are stout and sharply ascending. Thorns are few and small. Scion undergrowth is present with

FRUIT CHARACTERS OF 'ENCORE,' 'PIXIE,' AND 'KING,' AT RIVERSIDE, CALIFORNIA, DURING THE SUMMER*

Rootstock and sampling date	Juice	Soluble solids	Acid	Ratio of solids to acid
'Encore' mandarin				
Sweet orange				
Sept. 18, 1958	43.2	16.1	1.29	12.5
Troyer citrange				
July 29, 1960	48.3	15.2	0.89	17.1
July 12, 1962	49.1	15.5	0.89	17.2
Aug. 28, 1963	41.1	17.5	0.86	20.3
Aug. 13, 1964	51.8	14.8	0.83	17.8
'Pixie' mandarin				
Trifoliolate orange				
Aug. 10, 1954	36.8	14.3	0.77	18.6
June 18, 1957	42.9	15.5	0.86	18.0
Troyer citrange and sweet orange				
July 12, 1962	47.5	17.0	0.86	19.8
July 11, 1963	34.1	13.2	0.60	22.0
May 19, 1964	42.3	12.8	0.81	15.8
'King' (tangor?) parent				
Sour orange				
July 11, 1963	34.4	14.5	0.76	19.1
Aug. 13, 1964	42.5	17.1	0.98	17.4

* Data from several individual trees, all five years or older from budding.

trifoliolate orange rootstock, but is only slight on 'Troyer' citrange. Bearing habit has been somewhat alternate. The tree bears a considerable proportion of inside fruits; outside fruits are subject to sunburn. Leaves are broad at the middle, large for mandarin type. Petiole wings are narrow, sometimes nearly lacking.

'Encore' and 'Pixie' may have limited market potential because of certain features. Their lateness is both an advantage and a disadvantage. The small size of 'Pixie' and the rind color of both hybrids are not ideal, but their pleasant flavor and ease of handling are in their favor. Climatic effects on rind color and fruit size are very marked in citrus, and some growing areas will be more favorable than others for these fruits. Samples of 'Pixie' from Tulare, Ventura, and Orange counties have been seedless and of good flavor; but in the Coachella Valley desert area, the yield of 'Pixie' has been very light, and the fruit is dry.

'Pixie' should have appeal as a home garden fruit because of its seedlessness. In the case of 'Encore,' it is not yet certain whether isolated trees will set fruit without cross pollination by other citrus varieties. Under the California domestic virus-indexing program, budlines of both hybrids have been maintained free from tristeza, psorosis, vein enation and, apparently, exocortis.

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