OTHER SUBJECTS

Compatibility Study of Citrus Rootstock Varieties on Rangpur Lime

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Citrus species and cultivars normally utilized as rootstocks were budded on Rangpur lime, Cravo, with the objective of establishing an orchard to furnish seeds to citrus nurseries.

Fifteen citrus types were propagated and planted in the field. From 1975 to 1979 abnormal growth of some combinations and death of others, and differences in trunk diameter between scion and stocks, were observed. These observations are the subject of this paper.

MATERIALS AND METHODS

The source of material for budding on Rangpur lime was the nucellar collection of Limeira Experimental Station which is normally virus-free except for tristeza. Budding was done in 1974, on the same nursery stock of Rangpur lime, at the Faculdade de Ciencias Agrarias e Veterinarias de Jaboticabal.

The following citrus species and cultivars were budded: Alemow, Taiwanica, Volkameriana lemon, Karna, Sunki, National, Florida and Africa rough lemons, sour orange, *Citrus reshni*, Caipira, sweet orange, trifoliate orange, Carrizo and Troyer citranges, and Swingle citrumelo. Ten to 50 trees of each scion/rootstock combination were planted in 1975 on a 7 x 7 m spacing, in rows, without replication.

To evaluate compatibility between the scions and the Rangpur lime, the trunk diameter 5 cm above and below the bud union was measured in 1979, and observations of the occurrence of abnormalities of the tree and trunk were made. The number of trees measured was the same as the number planted except where trees died. The average trunk diameter was taken from the measured trees of each combination.

Tristeza is endemic and the scions were not tested for exocortis, xyloporosis and psorosis, but Rangpur lime is susceptible to exocortis and xyloporosis and did not show any symptoms 5 years after budding.

RESULTS AND DISCUSSION

Table 1 shows the number of trees planted and measured in each combination. Some death of trees occurred, mainly with Karna, sour orange, and Alemow. Most of the tree death occurred at the time of planting, but some death occurred after that period, from 1975 to 1979, and was caused by gummosis, tristeza and, perhaps, by stock/scion incompatibility.

The average trunk diameter above and below the bud union indicated the occurence of bulged scions above the bud union for some varieties, especially Swingle citrumelo and Carrizo citrange. In other scions, like trifoliate orange and Troyer citrange, the same symptom appeared, but not in all trees, and was not reflected by the average measurements. In the above four combinations

TABLE 1
NUMBERS OF TREES OF 15 CITRUS CULTIVARS BUDDED ON RANGPUR LIME, THEIR AVERAGE TRUNK DIAMETER AND OCCURRENCE OF SCION ROOTSTOCK ABNORMALITIES

Scions	Number of trees planted	Number of trees studied	Average trunk diam 5 cm above the bud union (cm)	Average trunk diam 5 cm below the bud union (cm)	Abnormalities on the trunk
National rough lemon	10	9	9.06	9.73	Normal
Caipira sweet orange	51	46	7.90	8.86	Normal
Taiwanica	10	9	7.65	9.70	Normal
Cleopatra mandarin	47	46	7.64	8.31	Normal
Swingle citrumelo	14	14	7.27	6.28	Scion bulge
Trifoliate orange	47	45	6.88	7.02	Scion bulge
Florida rough lemon	11	11	6.77	7.43	Normal
African rough lemon	10	9	6.63	6.91	Normal
Volkameriana lemon	49	48	6.60	7.11	Normal
Sunki mandarin	55	42	6.45	7.87	Normal
Sour orange	10	6	6.45	7.35	Rootstock pitting
Alemow	10	4	6.42	7.45	Scion pitting
Troyer citrange	50	41	6.04	6.38	Scion bulge
Citrus karna	11	7	5.63	6.66	Normal
Carrizo citrange	10	10	5.36	5.24	Scion bulge

with Rangpur lime, a dark colored ring similar to that reported by McClean (1974) was not observed, but intense sprouting of the rootstock occurred in the bulged trees.

The other combinations tested did not show the incompatibility problem or bud-transmitted diseases and tristeza.

The trunk diameter above and below the bud union was large on the National rough lemon trees, with an average of more than 9 cm. Taiwanica trees had large diameter only below the bud union. The mandarin, sweet orange, sour orange, African and Florida rough lemons, and Volkameriana lemon trees had intermediate diameters, normally with a large diameter below the bud union. The smallest trunk diameters were obtained with Carrizo citrange and Karna trees.

Mild symptoms of tristeza were observed in one tree of Rangpur lime budded with sour orange, but perhaps the rootstock was a hybrid. Other trees of the same combination grew well, although some death occurred at planting time.

Severe tristeza stem pitting occurred on the trunks of Alemow, but not on Rangpur lime. Symptoms were noted previously on the mother trees of Alemow (Salibe, 1973, and Donadio *et al.*, 1974). The occurence of tristeza did not cause any incompatibility symptoms between Alemow and Rangpur lime, but a large percentage of trees of this combination was lost.

CONCLUSIONS

Almost all of the 15 cultivars had good compatibility when budded on Rangpur lime, except for trifoliate orange and its hybrids, citrange and citrumelo. The occurence of bulged scions and abnormal sprouting of the Rangpur indicated the possibility of incompatibility, but without death of trees or a ring at the union, perhaps because the trees were young. The presence of tristeza virus did not influence compatibility.

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