

Response of Tydeman's Red Apple to Cross-Pollination

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The Tydeman's Red apple has become established in Washington as a good quality summer variety. Plantings of two to five acres can be found at East Wenatchee, Orondo, and Bridgeport in North Central Washington. Generally, these blocks have been set to solid Tydeman's Red, presuming that this variety was self-fruitful. Horticulturists in Washington and British Columbia have been unable to confirm this assumption. Therefore, a limited study was undertaken at Wenatchee, Washington to determine the fruitfulness of Tydeman's Red.

The manager of Lovitt Orchards co-operated, and Golden Delicious pollen was provided by L. C. Antles Pollen and Supplies.

Methods

Young, vigorous trees of Tydeman's Red, budded on McIntosh trunks on EM IX rootstocks, were used in this test. The McIntosh trees were planted in 1960 and budded to Tydeman's Red the following summer.

In 1964 and again in 1966 six limbs, averaging fourteen flower clusters on each limb, were covered with sacks made of cheese cloth just prior to blossoming. Flowers on the protected clusters were pollinated by hand, using Tydeman's, Red Delicious and

Golden Delicious pollen.

The pollen was applied to the stigmas with a small brush every 48 to 72 hours during the blossoming period. The petals of flower buds about to open were pinched off and pollen was applied; and pollen was also applied to flowers which had opened naturally.

On the self-pollinated flowers (Tydeman x Tydeman) freshly released pollen was distributed from anthers to stigmas of flowers on the same protected limbs. Pollen was taken from Red Delicious flowers which were not protected from pollen-carrying insects. The Golden Delicious pollen was from a commercial pollen supplier.

In all cases the protected hand-pollinated flowers received an abundance of Tydeman's Red pollen. Contamination of Red Delicious pollen, with other than Tydeman's pollen, should have been very light as the planting consists only of the two varieties and is isolated from other apple trees. Fruit counts were made on July 28, 1964 and August 3, 1966.

Results and Conclusions

The percent of flower clusters which set fruit with each treatment was as follows:

TABLE I
Count of Flower Clusters and Fruits set on Bagged Tydeman's Red Apple Tree Limbs

Pollen	Flower Clusters Bagged					Fruits Set					Clusters Fruiting
	1964	1966	1964	1966	Total	1964	1966	1964	1966	Total	
Tydeman's (protected)	18	16	13	11	58	1	1	1	1	4	6.9%
Red Delicious (not protected)	15	16	10	13	54	2	3	2	4	11	20.4%
Golden Delicious (commercial)	12	21	11	14	58	9	1	3	6	19	32.8%

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Tydemán x Tydemán	6.9%
Tydemán x Red Delicious	20.4%
Tydemán x Golden	32.8%

More detailed figures are presented in Table 1.

Since the number of flowers used in this study was relatively small, and because no weather data for the two years of the experiment were collected, the results are not conclusive. However, it can be said that, during the two years in which this study was

made, the Tydemán's Red apple appeared to be only partially self-fruitful; and from this evidence, it would probably be wise to have another variety in the orchard with it as a pollinizer.

To more conclusively determine the pollination requirements of Tydemán's Red, these experiments should be repeated on a larger scale, meteorological data should be collected, and other pollinizing varieties should be tested.

A Method of Finding the Most Likely Parents of Chance Seedlings of Fruits

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Amateur and professional fruit breeders like to know the parentage of varieties that they plan to use in their work. But many kinds are chance seedlings, and the search for their parents is usually unsuccessful.

We still do not know how all of the traits that make up the genetic pool of fruits are inherited. However, we do know that sooner or later, "like" produces "like." This may not occur in the first generation; and the "like" may be an isolated trait, with most of the other characters being derived from other ancestors. Yet it is reasonable to believe that a characteristic is more apt to be derived from a variety visibly showing it than from one that doesn't. The following method of determining the most likely parents is based on this assumption.

One must first estimate the date when the seedling that you happen to be investigating was started. This period is always longer with chance seedlings than with varieties developed by controlled breeding, due to the incessant browsing and cutting that the average wildling has to en-

dure. From personal observation of pasture clump seedlings, I believe that it takes about fifty years from the time the seed is deposited until such time that the seedling begins to attract attention. Therefore, all varieties introduced after the estimated date of origin could not have been the parents. One must also rule out triploid varieties like Baldwin and Gravenstein, since their seedlings are too weak to survive.

A list should then be made of the many characteristics of the seedling selection. By this time, one will have a fair idea as to which older varieties it most nearly resembles. It is well to carefully examine the actual fruit and tree of the probable parent varieties, while following the descriptions used in the best pomological books available. For American apple varieties, "Apples of New York," published by the N. Y. Agr. Exp. Station, is unquestionably the best there is for this purpose. Next, the various traits of the old kinds that it most closely resembles should be written down, comparing these with the list first made.

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