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FRUIT AND NUT CROPS RESEARCH IN TEXAS, 1987

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SUBJECT TOPIC: Stonefruit Scion Breeding and Genetics

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CROP(S):
1. Peaches
2. Nectarines
3. Plums
4. Apricots

ABSTRACT:

Objectives:

1. Evaluate stonefruit materials for adaptation in Texas.
2. Develop a series of peach and nectarine cultivars for fresh consumption adapted to Texas conditions (350-750 hour chill zone).
3. Elucidate genetic inheritance of traits and genetic relationships among materials to improve breeding strategies.

General Approach:

1. Approximately 110 peach cultivars, 120 out-of-state peach advanced selections, 50 advanced selections from the Texas program, and 60 plum and apricot materials have been established at College Station and at Yoakum. These are evaluated yearly for crop, fruit characteristics and tree characteristics. More materials are collected every year.
2. Peach populations adapted to Texas conditions are being developed with a recurrent selection procedure complemented by the periodic introgression of new germplasm. In vitro embryo rescue techniques are used in the development of the early-maturing peach populations. About 5,000 peach seedlings are planted every year in a high density fruiting nursery for fruit evaluations. Within four years, the best of these are repropagated for further evaluation. A few of these second test seedlings are evaluated under commercial conditions.
3. Peach, plum, apricot and other Prunus germplasm is being assayed for variability in isozymes to develop a genetic marker system useful in identification of cultivars, hybrid verification, in studying germplasm collection

strategies, in comparing breeding strategies and in the quantification of genetic relationships.

Findings:

1. Evaluations from the last 20 years have been summarized. A progress report is being prepared. The ability of 'Texstar' peach to avoid spring frost damage was shown to be due to high bud density and extended bloom period.

2. In 1985, 7,000 seedlings from 200 families were planted. Few hybrid crosses were made in 1986, due to erratic spring weather but much material was collected from other breeders. In 1986, 500 embryo cultures were done with good success. Several selections were made from the crosses made in 1983. Five advanced selections were propagated for commercial testing.

3. Several hundred accessions have been assayed for isozyme variability for five enzyme systems (MDH, LAP, PGI, PGM, and 6PGD). Genetic studies of the variants are in progress. Biochemical fingerprinting using isozyme markers is not useful for peach varieties but is useful for plum and apricot cultivars. Systematic studies of species and genetic similarity among accessions are on-going.