sized seedlings of each of the five clones were lined out in nursery rows in the field. In August of 1976 each clonal line was budded to 24 each of eight virus-free apricot cultivars: Moorpark, Perfection, Rival, Royal, Scout, Skaha, Tilton and Wenatchee. All eight apricot cultivars were also budded on nine myrobalan seedlings each to serve as controls. Growth and survival counts of budded plants were made in May 1977, October 1977 and August 1978.

The data in Tables 1 and 2 show fair percentages of bud growth and survival of *P. tomentosa* seedlings up until May 1977, and excellent percentages on myrobalan seedlings. By October 1977 the survival percentage of apricots on *P. tomentosa* had deteriorated considerably, but survival on myrobalan seedlings remained constant.

At this time, incompatibility symptoms were observed on every apricot-tomentosa union, but none on apricot-myrobalan unions. Incompatibility was expressed as severe overgrowth of the apricot and weakness and breakage at the graft union.

By August 1978 only a few trees on *P. tomentosa* roots remained, and these broke readily at the graft union with slight bending. Thus, every tree on *P. tomentosa* roots in this test was lost due to breakage at the graft union. In contrast, all trees on myrobalan rootstocks had strong graft unions and grew normally.

In this test there were no *P. tomentosa* seed sources that produced seedlings compatible with apricots and therefore no compatible seedlings that could be selected for further trial as clonal rootstocks. Thus it appears that *P. tomentosa* is completely unsatisfactory as a rootstock for apricots.

The New York State Fruit Testing Cooperative Association—60 Years of New Fruit Varieties

ROBERT C. LAMB[1]

Sixty years ago the New York State Fruit Testing Cooperative Association, Geneva, N.Y. was incorporated. The purpose of this non-profit organization was to provide an efficient means of getting new varieties from the fruit breeding program of the New York State Agricultural Experiment Station at Geneva introduced into the fruit growing trade. Another objective was to get a wider test and quicker evaluation for promising new selections and new varieties. Healthy, true-to-name fruit trees of new and promising varieties were made available to growers who in turn were encouraged to report on the performance of these fruit varieties under their conditions. These remain in the basic purposes of the Fruit Testing Association today. The aims have been broadened to encompass new pomological technology such as special rootstocks and virus-free material.

In 1918, Professor Richard Wellington, a fruit breeder at the New York State Agricultural Experiment Station at Geneva, found that nurserymen were unwilling to propagate new untested varieties and so he was looking for a means of getting new introductions from the fruit breeding program

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into the horticultural trade. The idea of forming a cooperative association of fruit growers interested in new varieties was proposed. It received enthusiastic support from a number of fruit growers, including Mr. B. D. Van Buren of Niverville, N.Y., who served as President of the Association for its first 17 years. It was proposed that the Association would propagate trees of new varieties and sell them at cost to the members of the Association. Another responsibility of the Association was to collect and send out scions of varieties that were on test in Experiment Station orchards at Geneva.

In the first years the varieties listed by the Association were propagated under contract by W. and T. Smith, a commercial nursery in Geneva. Most of the trees were propagated on order for members and any surplus after the members' orders were filled was sold to non-members.

By 1923, the Association had grown to such an extent that a manager was hired and the Board of Directors were considering renting land so that they could do their own propagating. The Association has continued to grow in membership and presently has nearly 6500 members all across the United States and in many foreign countries. The list of varieties of fruits that are propagated has grown as follows: in 1919, 9 varieties of 3 fruits were propagated; 1929, 58 varieties of 11 fruits; 1939, 132 varieties of 15 fruits; 1949, 142 varieties of 15 fruits; 1959, 185 varieties of 19 fruits; 1969, 239 varieties of 22 fruits, and in 1978, 248 varieties of 22 fruits.

As an additional service, a wide range of available rootstocks for apple and pear enabled growers to obtain newer varieties on the rootstock of their choice. The close relationship between the Experiment Station and the Association meant that the latest findings of the rootstock research were quickly passed on to the membership. The best Malling rootstocks for apples, quince rootstocks for pears, virus-free mazzard and mahaleb rootstocks for cherries, Siberian C rootstocks for peaches and phyloxera resistant stocks for grafted grapes are all available now.

The Department of Pomology and Viticulture, N.Y.S. Agricultural Experiment Station, Geneva carries on an extensive program of variety testing and fruit breeding. As varieties or selections which have promise for New York State conditions are identified by the Pomology and Viticulture staff, they are added to the Fruit Testing Association list. Those which become important and generally available through commercial nurseries or those that have failed for any reason are removed from the list. The Pomology and Viticulture Department also has an active program in other areas of fruit research and where possible, the findings of this research are put into practice by the Association. For example, as research showed that Malling rootstocks were of value, they were made available to members of the Association.

An objective of propagating only virus tested varieties was instituted in recent years. This started with raspberries and strawberries and has been expanded to include cherries and grapes. The problem of obtaining and maintaining virus-free materials for all of the fruits that are listed in the catalog is formidable. In the future, however, the Association expects to use only indexed or certified materials for all the fruits they propagate.

The Fruit Testing Association has access to the extensive variety collection of the Experiment Station to supply scions or budwood of any variety that is on test and is not patented or otherwise restricted. They also have a custom-budding service so that special varieties and scion/rootstock combinations can be supplied on order.

The New York State Fruit Testing Cooperative Association has become the American representative of a younger Canadian association, the Western Ontario Fruit Testing Association, so that introductions from the CDA Harrow Station, Ontario, Canada, can be made available in the United States. Hopefully the reverse situation can be established as well, so that American introductions will have an easier availability in Canada.

The objective of getting reports on the performance of new varieties from members has not been completely achieved. Although some of the numbered selections that have been sent out have been named and introduced, at least in part, on the basis of recommendations of Association members, more reports of this sort would be most helpful. Many members are very cooperative in bringing to the Association's Annual Meeting samples of these new fruits that they have grown. However, many trees and vines are sent out with no report ever received back. In making the decision of whether a numbered selection should be named or discarded, information from members who have tested the selection is most helpful. The fruit breeders need to know the good points and the bad points before a new variety is named. Questionnaires have been used on occasion, but response has usually been rather disappointing. In all reports of performance on new varieties, it is extremely helpful to relate them to the performance of standard varieties in such characteristics as hardiness, susceptibility to disease, production, etc. The more information that is included in a report of a new variety, the more valuable it is.

Membership in the Association is open to any fruit grower, either commercial or hobbyist, who is interested in new fruit varieties, on the payment of $5.00 annual dues. Each member receives a copy of the current catalog, published annually, in which the new varieties are described in an objective manner listing their strengths and weaknesses as far as they are known.

Although there has always been very close cooperation between the Association and the New York State Agricultural Experiment Station, the two are separate agencies and there has been no financial support of the Association by the State of New York. The Association is incorporated as a Cooperative under the laws of the State. It is operated on the income from the sale of nursery stock and dues. For this reason, the cost of trees from the Association tends to be higher than trees from commercial nurseries. The extra work in budding many small lots and keeping the records, as well as the difficulty in predicting the demand for 248 different varieties two years in advance makes the cost of producing trees higher than for a commercial nursery. It is not the purpose of the Association to compete with the many nurseries in New York State, but rather to bridge the gap between the introduction and the creation of a demand for new fruit varieties. They also try to fill demands for services not generally available from commercial nurseries. Such a service is double-working Bartlett pears on dwarfing stocks because of the incompatibility of that variety worked directly on quince.

The day-to-day operation of the Association is the responsibility of the Manager. The over-all management is carried out by a Board of Directors elected from the membership. The President of the Board is elected from among their members. The Head of the Department of Pomology and Viticulture at the Experiment Station is the Secretary-Treasurer of the Association.

An anniversary is a time not only for reviewing the past, but for look-

ing forward to see if the Association can improve the services to its members. There is much to be done in the field of propagating virus-free varieties and rootstocks. Patenting of the introductions of experiment stations is becoming more popular now and this presents a problem for the Association; this problem is being studied. Patent laws do not lend themselves to the present Fruit Testing Associaion procedures. For example, patented varieties may not be propagated and sent out to whomever would like to try them. Royalties from the sale of patented new varieties do provide some income in times of reduced research budgets, which is important. So it becomes a question of: is it better for the fruit growing industry to get an early and widespread testing of new varieties or to license a commercial nursery to propagate and promote a patented variety and receive the profits from it? At the New York State Agricultural Experiment Station, fruit breeders feel that the former is the better plan. The testing of a new variety takes many years at best and the Fruit Testing Association offers the best means of speeding up this process on the most equitable basis.

Evaluation of Selected New Summer Apple Cultivars in Tennessee

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Several new summer apple cultivars have recently been evaluated in Tennessee. Summer cultivars are those which mature their fruit in July or August. No summer cultivar is listed among the 15 major apple cultivars grown in the U. S. Fruit of established summer cultivars is soft, has a rapid respiration rate, and storage life is usually short. The soft fruit is easily bruised and is hard to harvest and ship without damage. Fruit color is usually poor due to the high temperatures encountered during fruit maturation.

Increased use of controlled atmosphere (C. A.) storage has decreased demand for summer cultivars because the higher quality winter apples compete directly with them. However, local market demand for summer cultivars remains strong in some areas.

This article describes performance of 10 new summer apple cultivars tested in screening trials at the University of Tennessee Plateau Experiment Station near Crossville, Tennessee.

Materials and Methods

The 10 cultivars including the rootstock, year planted, and number of trees planted are listed in Table 1. The planting was established between 1969 and 1970 with two or three trees of each cultivar being planted. All were on a clonal rootstock. Rootstock selection was limited with the new cultivars. Rootstocks included were M. 7, MM 106, and MM 104. Trees on M. 7 and MM 106 have usually started production a year earlier than trees on MM 104.

The orchard site is at 1900 feet elevation. Soil type is Hartsells sandy loam. Rainfall has averaged 54 inches annually with rather favorable distribution. Day temperatures have seldom

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