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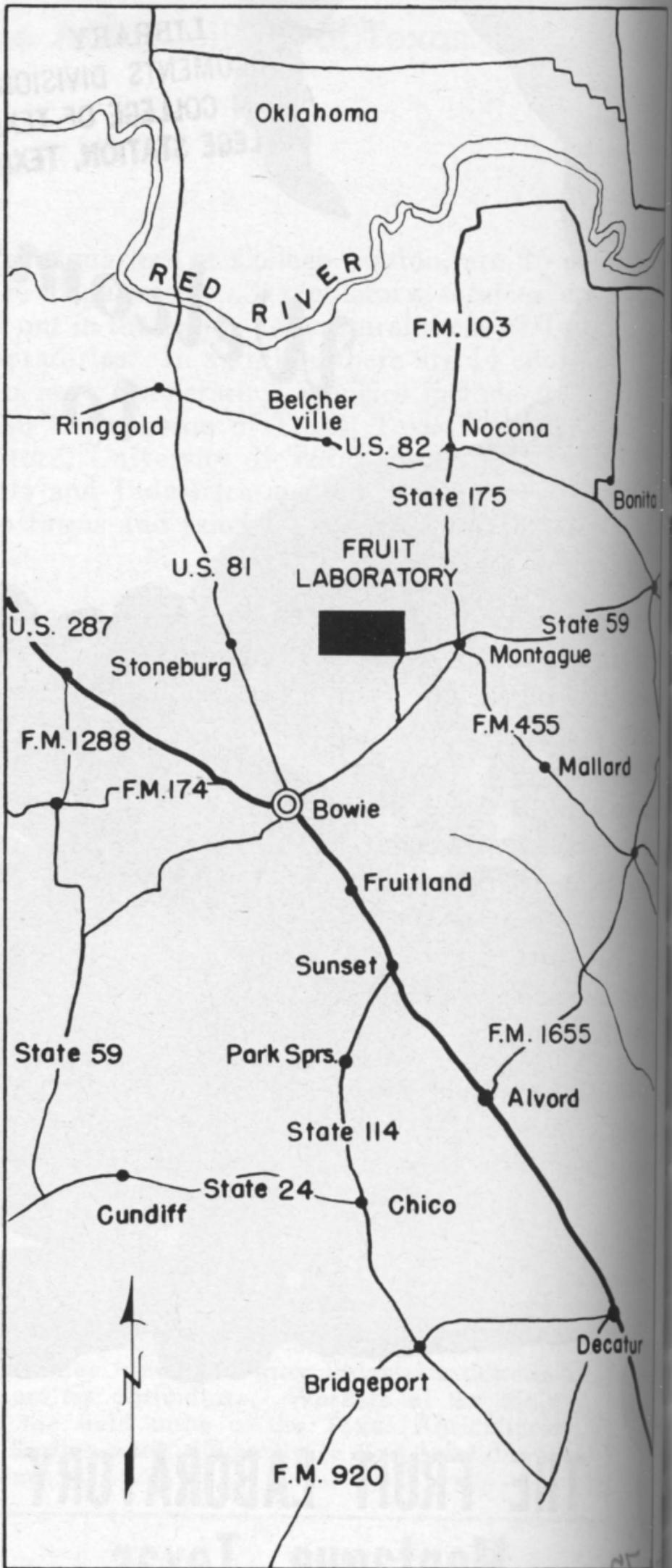
Welcome
to



THE FRUIT LABORATORY
Montague, Texas

THE AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS
TEXAS AGRICULTURAL EXPERIMENT STATION
R. D. Lewis, Director, College Station, Texas

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Welcome
to the
FRUIT LABORATORY
Montague, Texas

The Montague Fruit Laboratory was established in 1937 by the Texas Legislature for research in commercial production of grapes. Encompassing 56 acres, the laboratory is located 2½ miles southwest of Montague on a county road intersecting State Highway 59. Two years after establishment, research activities were expanded to include studies of peaches, plums, pears, apples and berries.

Soils consist of Windthorst and Stephenville fine sandy loams, typical of the West Cross Timbers. The elevation is approximately 1,160 feet above sea level. The average annual rainfall over a 20 year period has been 33.2 inches with extremes of 21.3 and 54.5 inches recorded. Rainfall averages approximately 4.5 inches per month through April, May and June, resulting in moisture conditions generally desirable for production of fruits which mature prior to mid-July. From the middle of July to the first of September, soils are generally too dry for best yields.

On the average, the first killing frost in the spring occurs on March 26 and the last killing frost occurs on November 9, providing a growing season of 226 days. Average temperatures range from 45 degrees in January to 86 degrees in August.

Although other field stations of the Texas Agricultural Experiment Station devote some attention to grapes, the Montague Laboratory is considered the grape research center of Texas. One of the largest collections of grape varieties in the nation is maintained here and over 800 kinds have been grown and observed for characteristics suited to grape production in this area. In addition, cuttings from many varieties have been sent to several foreign countries for testing.



Annual field days bring latest research information directly to farm men and women.

A field day is held early in July each year. Sponsored by many farm and business organizations, it has grown into one of the top agricultural events in Texas. Several hundred visitors attend each year to observe new varieties of fruits and grapes, and to get first hand information on fertilizer studies, methods of pruning and other improvements in production and marketing.

Visitors are always welcome at the Fruit Laboratory. The address is Montague, Texas, and the telephone number is 2904.

URIEL A. RANDOLPH,
Superintendent

Research Projects

PEACHES

Variety Studies

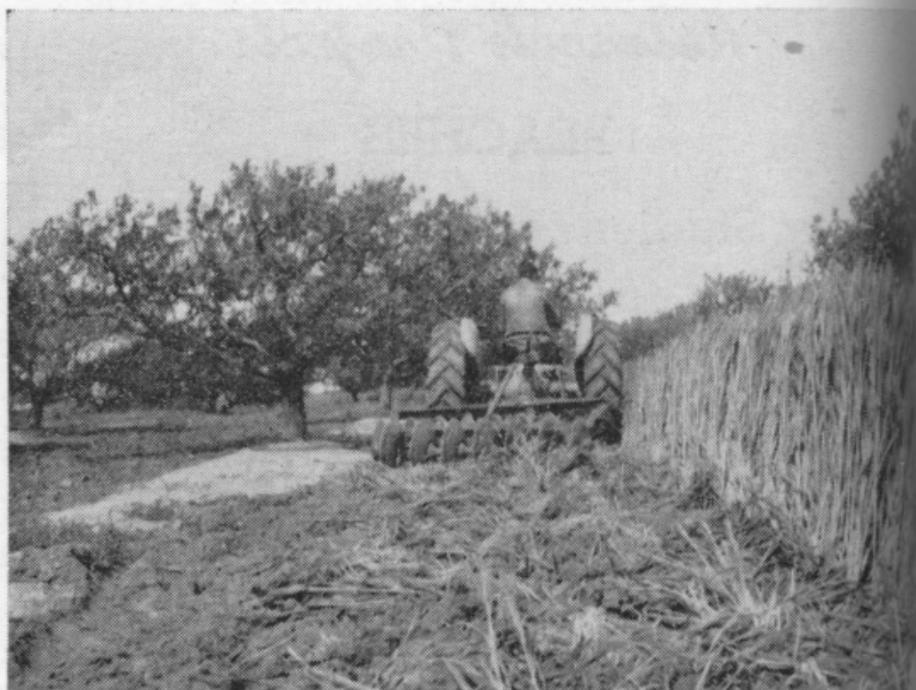
Peach studies primarily are confined to the introduction of varieties with ability to withstand late freezes and, therefore, able to bear fruit consistently. Some of the characteristics which influence regularity of production are time of bloom, length of blooming period and hardiness of the bud, flower and young fruit. To date, 112 varieties have been observed in this test. Three varieties developed in Canada had late blooming characteristics, but their fruit did not possess qualities necessary for commercial production.

Ranger, introduced in 1952, blooms late and has good commercial qualities. It has produced in years when the popular Elberta failed. Other fairly consistent producers possessing good commercial qualities are Cardinal, Dixigem, Coronet, Redglobe and Redskin.

The newer Keystone is a large, tasty peach with much eye appeal. Its ability to produce regularly, however, has not been tested to satisfaction. Over a long period of time, the Veteran variety has been the most consistent producer in the station orchard. This semi-cling



The Redglobe peach is a dependable producer in North Texas orchards.



Fertilized small grain cover crops pay dividends in peach orchards.

peach ripens in mid-season and is desirable for home orchards.

Fertilizer Studies

For several years a comparison has been made between the application of nitrogen alone, a balanced fertilizer of a 1-2-1 ratio and no fertilizer in the Elberta orchard. A study has also been made on the effect of turning under cover crops of small grain with half the area fertilized and half without fertilizer.

Although effects of both fertilizer and cover crops have varied, there have been sizeable increases in yields from all treatments. The most profitable gain has resulted from the combination of a winter cover crop which had been fertilized at planting time with 180 pounds of 5-10-5 per acre, followed by a spring application of 10 pounds of 5-10-5 to each tree.

GRAPES

Variety Studies

The Carman grape was the most commonly produced variety in North Texas for many years because of its high productivity and comparative freedom from diseases and insects. The Concord, however, is superior in quality and is preferred in the manufacture of products although it is not adapted to Texas conditions.

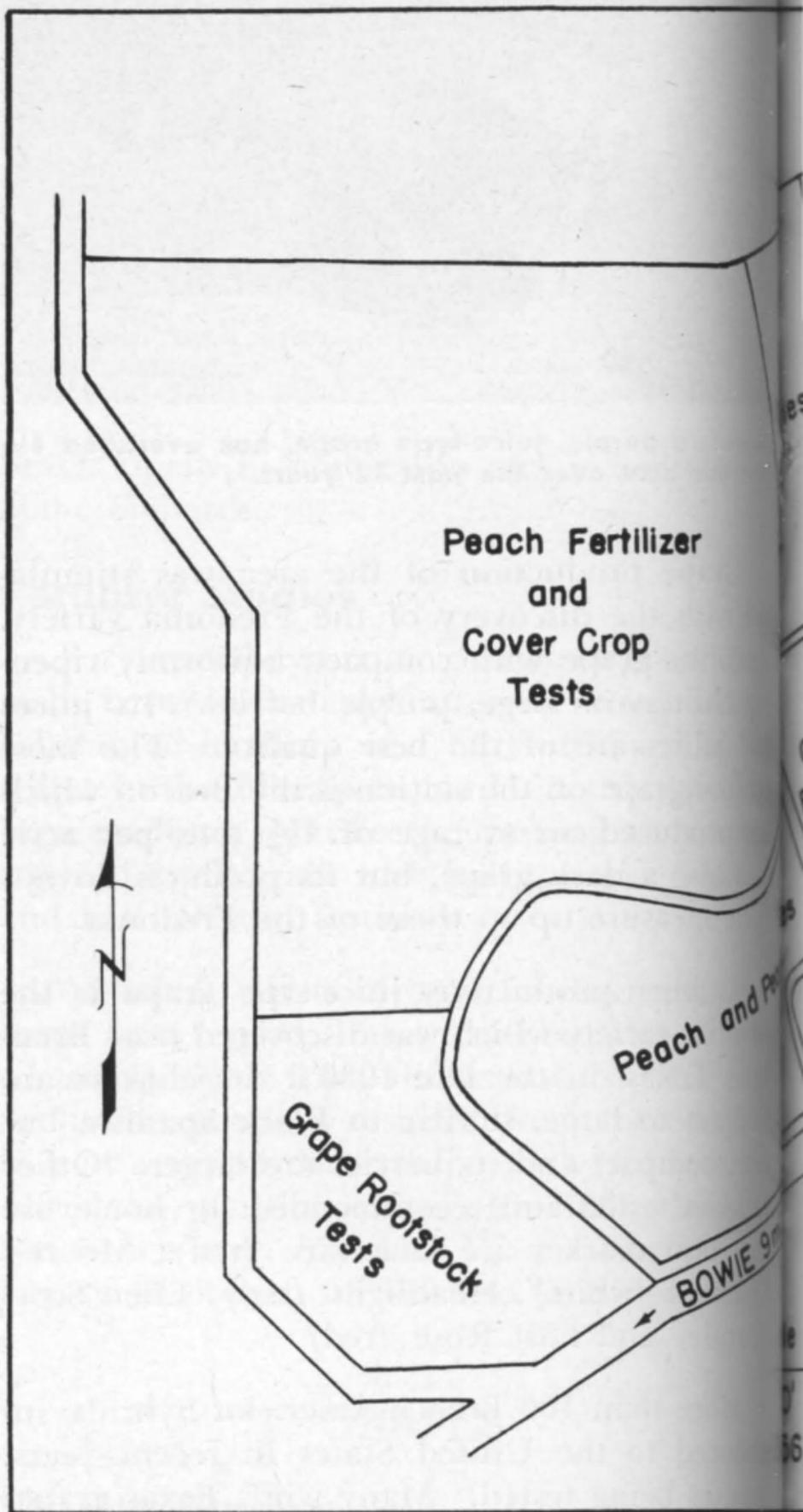


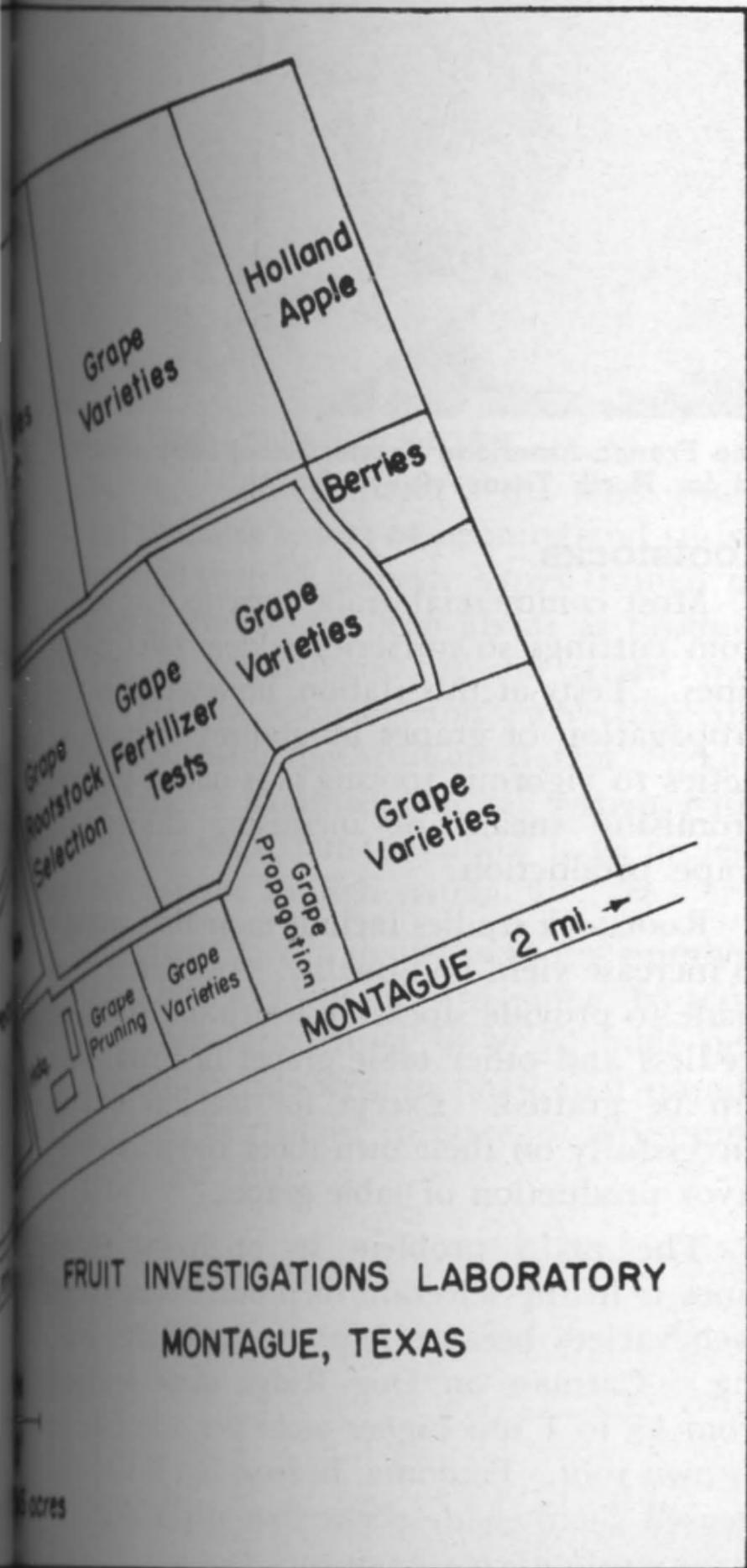
Beacon, a purple, juice-type grape, has averaged $4\frac{1}{2}$ tons per acre over the past 12 years.

Grape production of the area was stimulated with the discovery of the Fredonia variety, a prolific grape with compact, uniformly ripening clusters of large, purple berries. Its juices and jellies are of the best quality. The most prolific grape on the station is the Beacon which has produced an average of $4\frac{1}{2}$ tons per acre. It is also a dark grape, but its products do not quite measure up to those of the Fredonia.

Another productive, juice-type grape is the Favorite variety which was discovered near Brenham, Texas, in the late 1930's. Its clusters are medium to large, similar to Black Spanish, but more compact and its berries are larger. Other varieties tested and recommended for home use and local market are Delaware (red), Moore's Diamond (white), Headlight (red), Ellen Scott (purple) and Last Rose (red).

More than 100 French-American hybrids, introduced to the United States in recent years, are now being tested. Many wild, Texas grapes were used by French breeders in these crosses, which accounts for the fact that some are well adapted to Texas conditions. Several show promise for use as table grapes, for juice, or for both. Table grapes have tight skins while juice and jelly grapes have skins which slip from the flesh. Outstanding hybrids for table use are the Seibel 9110 and Seibel 14654.







The French-American hybrid, Seibel 14654 is well suited for North Texas vineyards.

Rootstocks

Most commercial grape varieties root readily from cuttings so nurseries seldom offer grafted vines. Tests at this station, however, show that propagation of grapes by grafting desirable varieties to vigorous rootstocks is one of the most promising means of increasing efficiency of grape production.

Rootstock studies include more than attempts to increase yield and quality. An effort is being made to provide stocks on which the Thompson seedless and other table grapes in South Texas can be grafted. Except for inability to grow successfully on their own roots, conditions there favor production of table grapes.

The main problem in producing grafted vines is in the selection of proper rootstocks for each variety because response varies after grafting. Carman on Dog Ridge stock produced from $\frac{1}{2}$ to 1 ton higher yield per acre than on its own root. Fredonia, Beacon and Favorite increased their yields about $\frac{1}{2}$ ton per acre after being grafted on Champanel rootstock.

A wide selection of seed from wild vines as well as from commercial varieties has provided a large number of selections for rootstock testing.

Fertilizer Studies

The use of commercial fertilizer and barnyard manure has proved profitable in grape

production in North Texas. Best results have been obtained from mixed fertilizers with applications of at least 36 pounds of phosphorus per acre. Half of the fertilizer was applied when cover crops were planted in the fall; the remainder was applied in the spring. The use of nitrogen alone, or in combination with potassium, has not increased yields. Since phosphorus has not been tested alone, it is recommended that a complete fertilizer of a 1-2-1 ratio be used.

Applications of 8 tons of barnyard manure per acre increased yields approximately the same amount as did mixed fertilizers containing phosphorus.

Pruning and Training Vines

The 4-cane Kniffen trellis is the most practical and profitable system of pruning and training American types of grapes. Vines trained to the Munson system have been about as productive, but the original cost of the trellis was greater. Pruning, spraying and harvesting are more difficult with the Munson system. Some growers prefer a modified renewal system with shorter vine stumps, but tests show it to be less desirable than the Kniffen system.

Many growers are in doubt as to the number of fruiting buds to leave on each vine. In tests where numbers varied from 40 to 72 buds per vine, yield differences were so small that no advantage could be claimed in favor of any number within that range.



The 4-cane Kniffen trellis has proved best for American-type grapevines.

Cover Crops for Grape Vineyards

For the past 12 years, cover crops including vetch, Austrian winter peas and mixtures of small grains have been planted in vineyards to determine their usefulness in grape production. Contrary to expectations, results did not favor discing green matter into the soil as grape yields were higher in areas where cover crops were not planted. Cover crops did serve a useful purpose in reducing erosion, but resulted in reduced net profit.

Vine Spacing

Tests have been conducted with three different spacings of grapevines. The distance between rows was 12 feet in all cases as this interval has proved to be satisfactory for cultivation, harvesting and removal of prunings. These tests included vines planted at 8, 10 and 12 foot intervals. Vines planted 8 feet apart in the row produced greater per acre yields than those in wider spacings.

Planting Elevation

Grapes growing at lower elevations have been damaged less from late spring freezes than those growing at higher elevations. In most years, damage from cold results from strong winds rather than from frost, therefore high points are less desirable.

Production from different elevations has been influenced as much by depth and texture of the soil as by location. In general, deeper soils are found at lower elevations and produce the highest yields.

Terraced Vineyards

Tests have demonstrated the importance of terracing rolling lands before grapevines are planted. Increased importance is attached to terracing as an erosion control measure since cover crops have not contributed to net income. Yield records reveal small differences between vines growing above, on top of, or below terraces.

APPLES

The Holland apple has performed exceptionally well at the station even though Texas cli-



This 16-year-old Holland apple tree produced 8 bushels of good quality fruit in one season.

matic conditions generally are not favorable for commercial apple production. Holland is a commercially desirable, large, red apple. Its early maturing date allows it to reach the market ahead of quality apples from other sections of the United States. It should be interplanted with King David as a pollinizer.

Red Delicious, Golden Delicious and King David have proved very suitable for home orchards in North Central Texas.

PLUMS

Outstanding among the 15 varieties of plums tested are Bruce, Methley, Sapa and Munson. Methley is recommended for its high quality although it blooms early and does not set a crop of fruit as often as other varieties tested. Sapa blooms late and has been the most consistent producer.

PEARS

Pears have proved to be a very hardy fruit in most sections of Texas. Tests at the laboratory have shown that Bartlett is very susceptible to fire blight disease, resulting in early death of the trees. Varieties which have proved hardy and productive over a number of years are Kieffer, Garber, LeConta and Douglas. A more intensive study of pear varieties will be made in the future.

BERRIES

Outstanding among berries tested at the laboratory is the Dew Black, sometimes called Won-

der. Both quality and production of this hardy berry have been good. Boysen and Young berries have not proved worthy of recommendation for commercial production. McDonald and Dallas, although lower in both quality and production than Dew Black, are desirable in home gardens because they have different periods of ripening. Brazos has not been tested at this location.

STATE-WIDE RESEARCH

The Texas Agricultural Experiment Station is the public agricultural research agency of the State of Texas, and is one of the parts of the Agricultural and Mechanical College of Texas.

The Main Station and headquarters are located at College Station, with 20 substations and 9 field laboratories located throughout major agricultural areas of Texas. In addition, 15 co-operating stations are owned by other agencies, including the Texas Forest Service, the Game and Fish Commission of Texas, U. S. Department of Agriculture, University of Texas, Texas Technological College, Texas College of Arts and Industries and the King Ranch. Some experiments are conducted on farms and ranches and in rural homes.

The Texas Agricultural Experiment Station is conducting about 430 active research projects, grouped in 25 programs which include all phases of agriculture in Texas.

Research results are carried to Texas farm and ranch owners and homemakers by specialists and county agents of the Texas Agricultural Extension Service.

ADMINISTRATION

R. E. PATTERSON, *Dean of Agriculture*

R. D. LEWIS, *Director*

ROLAND J. HILDRETH, *Assistant Director*

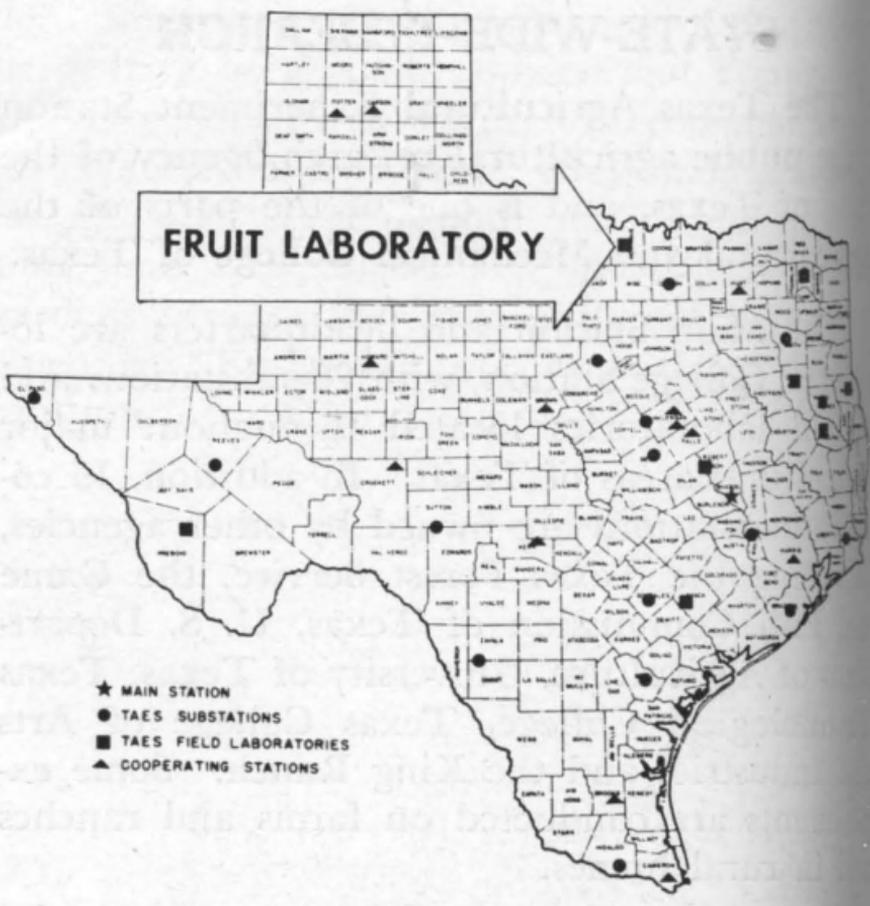
VICTOR E. SCHEMBER, *Assistant Director*

ALVIN A. PRICE, *Assistant Director*

College Station, Texas

AGRICULTURAL RESEARCH seeks the WHATS, the WHYS, the WHENS, the WHEREs and the HOWS of hundreds of problems which confront operators of farms and ranches, and the many industries depending on or serving agriculture. The workers of this substation, along with those of the Main Station and other field units of the Texas Agricultural Experiment Station, diligently seek to find solutions to these problems.

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FOR BETTER LIVING

Today all people have a stake in agricultural research. The quality and quantity of food, feed and fiber available for their welfare are dependent on the information developed through organized research.

The Texas Agricultural Experiment Station concerns itself with problems confronting, and likely to confront, farmers and ranchmen, rural homemakers, farm groups and representatives of other organizations depending on or serving agriculture.

Continued agricultural research is necessary to point the way toward maintaining and improving our productive resources; lowering cost of production; improving quality; expanding markets; devising new and better methods for growing, processing, distributing and utilizing farm and ranch products and toward better city and country living.

Researchers of the Texas Agricultural Experiment Station are dedicated to that aim. *Today's Research is Tomorrow's Progress.*