History of the location as seen from a plant breeder's perspective.

Origin of the ARS station

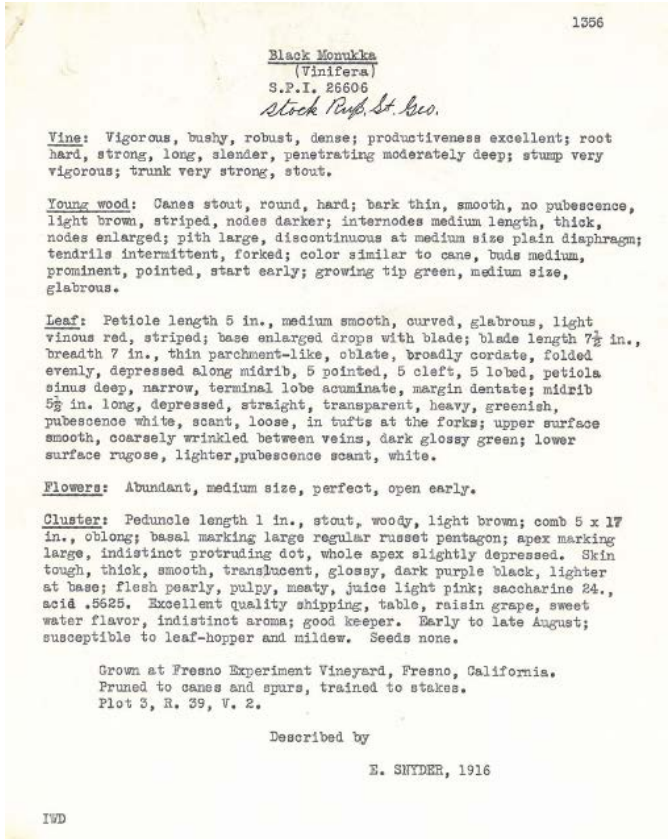
Our location's beginnings started in southeast Fresno, near the corner of Peach & Butler Avenues. That location, known as the 'Peach Avenue Station,' began functioning in 1916. The Peach Avenue Station actually came about through the collective actions of California grape growers back in the early years of the 20th Century. At that time, immigrants were arriving in the San Joaquin Valley and beginning to set up farming operations throughout the region. In many cases, the immigrants brought with them varieties of grapes from their home country, as there were many fewer laws at that time restricting the movement of plant materials around the world. This led to some confusion amongst newly arrived producers, as there were hundreds of varieties of grapes in circulation throughout the San Joaquin Valley, and recommendations were few, and perhaps biased, regarding those varieties best suited for any particular end use.

Unbiased recommendations of the best varieties to be grown for table grapes, raisins, and wine were desired by California grape growers, and vineyard land was provided to the Federal government by a consolidation of grape growers for that purpose. The donated 20 acre parcel was located southeast of Fresno, a location perfectly suited for varietal evaluation and comparison.

When the Peach Avenue Station was established, the Agricultural Research Service was not yet in existence. At that time, the 20 acre property was known as the USDA Experiment Vineyard, and was a part of the Bureau of Plant Industry (Fig. 1). Coming from Cornell University, Dr. Elmer Snyder arrived in Fresno in 1916 to manage the grape evaluation effort. Grape evaluations began immediately, with numerous formal evaluations occurring during the 1916 harvest year (Fig. 2). The USDA Experiment Vineyard remained solely a vineyard site without any sort of permanent buildings until 1927 when pump and implement sheds were built on the property.

There were numerous early publications by Dr. Snyder and his assistant Frank Harmon detailing the best existing grape varieties for table, raisin, and other purposes. But both Snyder and Harmon were

Fig. 1 Experimental vineyard established southeast of Fresno, CA, in 1916 for evaluating grape germplasm.



1356

Black Monukka
(Vinifera)
S.P.I. 26606
Stock Rup. St. Geo.

Vine: Vigorous, bushy, robust, dense; productiveness excellent; root hard, strong, long, slender, penetrating moderately deep; stump very vigorous; trunk very strong, stout.

Young wood: Canes stout, round, hard; bark thin, smooth, no pubescence, light brown, striped, nodes darker; internodes medium length, thick, nodes enlarged; pith large, discontinuous at medium size plain diaphragm; tendrils intermittent, forked; color similar to cane, buds medium, prominent, pointed, start early; growing tip green, medium size, glabrous.

Leaf: Petiole length 5 in., medium smooth, curved, glabrous, light vinous red, striped; base enlarged drops with blade; blade length 7½ in., breadth 7 in., thin parchment-like, oblate, broadly cordate, folded evenly, depressed along midrib, 5 pointed, 5 cleft, 5 lobed, petiola sinus deep, narrow, terminal lobe acuminate, margin dentate; midrib 5½ in. long, depressed, straight, transparent, heavy, greenish, pubescence white, scant, loose, in tufts at the forks; upper surface smooth, coarsely wrinkled between veins, dark glossy green; lower surface rugose, lighter, pubescence scant, white.

Flowers: Abundant, medium size, perfect, open early.

Cluster: Peduncle length 1 in., stout, woody, light brown; comb 5 x 17 in., oblong; basal marking large regular russet pentagon; apex marking large, indistinct protruding dot, whole apex slightly depressed. Skin tough, thick, smooth, translucent, glossy, dark purple black, lighter at base; flesh pearly, pulpy, meaty, juice light pink; saccharine 24., acid .5625. Excellent quality shipping, table, raisin grape, sweet water flavor, indistinct aroma; good keeper. Early to late August; susceptible to leaf-hopper and mildew. Seeds none.

Grown at Fresno Experiment Vineyard, Fresno, California.
Pruned to canes and spurs, trained to stakes.
Plot 3, R. 39, V. 2.

Described by

E. SNYDER, 1916

IWD

Fig. 2 Formal evaluation of *Vitis vinifera* L. 'Black Monukka' by Elmer Snyder at the Fresno Experiment Vineyard, 1916.

trained plant breeders, and the first grape hybridizations were made in Fresno during the 1923 bloom, initiating the grape breeding efforts at Fresno. In 1946, those hybridization efforts came to fruition, and a first table grape cultivar was named and released ('Cardinal') from the grape breeding efforts at the Peach Avenue Station.

Early developments in grape evaluation and breeding

In the 1930s, buildings began to spring up at the Experiment Vineyard. The annual grape hybridizations coupled with the ongoing varietal evaluation meant that there were plenty of grapes to evaluate, and lab and office spaces were needed. By today's standards, the first lab was rudimentary, but it served its purpose for basic fruit chemistry and physical evaluations (Fig. 3).

With new lab and office spaces, the Peach Avenue Station became productive in research on a variety of topics related to grape production. Snyder and Harmon published numerous research articles on various cultural practices affecting grape quality and methods of effective grape propagation. The elusive character of seedlessness was also examined in detail, as this character was of great importance to breeding, even in the mid-20th century. Between 1923 and 1951, nearly 46,000 grape seedlings were produced from planned hybridizations in the quest for new seedless cultivars. When seeded x seedless crosses were performed, a 13.5% seedless progeny was realized overall, but specific results varied widely depending on the parental choices.

History of the location as seen from a plant breeder's perspective.

Besides 'Cardinal,' Snyder and Harmon were also responsible for the development of table grape cultivars 'Calmeria' (1950) and 'Blackrose' (1951). These cultivars provided consumers at that time with table grapes that ripened earlier ('Cardinal') or later ('Calmeria'), or had better color and flesh crispness ('Blackrose') than the existing cultivars of the time.

Fig. 3 Early laboratory setting for grape evaluations at Peach Avenue Station, Fresno, CA

Addition of other research groups

Some of the buildings at the Peach Avenue Station were constructed by the Public Works Administration, a make-work agency set-up during the great depression for the unemployed. Prior to the actual construction at the location, a brick-making operation was initiated to produce the construction materials (Fig. 4). The Market Quality Research building was constructed with PWA manpower and was finished in 1933. This building provided research and office space necessary for the developing Market Quality Research program that had been previously housed at Fresno State College. At that time, research focused primarily on sulfur dioxide fumigation and other means of reducing table grape spoilage in route to market. By the mid-1930s, Market Quality research was running smoothly at the Peach Avenue Station.

The need to reduce spoilage of foods in transit was a lesson emphasized throughout World War II, and the Market Quality Research group expanded during the 1950s. Personnel with expertise in controlled atmospheres and fruit/vegetable respiration were added to staff. Buildings were enlarged to account for the new personnel and research.

History of the location as seen from a plant breeder's perspective.

Market Quality Research was comprised of two Sections: Stored Product Insects and Quality Maintenance and Improvements. Stored-product entomologists began joining the staff at the Peach Avenue Station in the mid-1960s. Permanent facilities for the entomologists were never planned, and research was conducted in a series of double-wide trailers that were wheeled into the site.

Fig. 4 Brickmaking by Public Works Administration for construction of federal buildings at the Peach Avenue Station site in the late 1920s.

In 1972, a further shuffling of Sections and Departments led to the initial organization of the Agricultural Research Service. The Peach Avenue Station became the Area Headquarters for the then California-Hawaii-Nevada Region. It was an important location and home to six labs in the Fresno area: Market Quality, Stored Product Insects, Transportation and Packaging, Fruit & Nut Crops, Insects Affecting Man & Animals, and Water Recharge. The Water Recharge group was the final group of researchers to make the Peach Avenue Station their home, moving from the Fresno Air Terminal in 1985 and being renamed Water Management.

Addition of stone fruit breeding to the Peach Avenue Station

California was changing quickly and dramatically in the 1950s. Many people were moving to California for the opportunities offered there. Housing needs for the new arrivals dictated the removal of once productive orchards as cities and suburbs expanded into agricultural lands. The San Joaquin Valley was not yet ripe for human growth and was viewed at the time as a new haven for orchards. But while the San Joaquin Valley offered vast and richly productive agricultural lands, the environment was sufficiently different such that once-productive varieties would no longer perform in the different environment. The new growing region necessitated new variety development.

Dr. John Weinberger came to the Peach Avenue Station in 1955 to manage the grape breeding program. But he was perhaps chosen for the position due to his reputation as an effective peach breeder in Fort Valley, GA, and the new need for peach variety development in the San Joaquin Valley.

History of the location as seen from a plant breeder's perspective.

Dr. Weinberger did bring his peach breeding expertise with him to Fresno, and began hybridizations in peach, plum and apricot during the 1956 bloom period. At that same time, an effective muscadine grape breeder named Horace Loomis from Meridian, MS, was brought to Fresno to assist Dr. Weinberger. Together, they made controlled crosses in both stone fruits and grapes and were responsible for evaluating and releasing several dozen new varieties.

Development of new stone fruit varieties at the Peach Avenue Station followed some basic objectives that are still pertinent to the program today:

- Develop earlier and later maturing varieties as compared with what was existing at the time.
- Emphasize quality characteristics (larger size, higher color, better sugar:acid ratio, firmer flesh)
- Improved resistance/tolerance to insects and fungal diseases
- Rootstock development for resistance to biotic and abiotic stresses

These broad objectives were pertinent to apricot, nectarine, peach and plum. In addition, pit-burn resistance was a major objective for apricot, as the 'Blenheim' variety performed very poorly in the San Joaquin Valley's high summer temperatures. Important stone fruit varietal releases by Weinberger and Loomis include the following:

Cultivar	Year of release	Impact/Importance
Apricot		
Castleton	1963	1st adapted apricot with pit burn resistance
Castlebrite	1977	early maturity, high box packout
Nectarine		
Independence	1965	early maturity, attractiveness, high productivity
Sunfre	1981	adapted for low chill environment
Peach		
Desertgold	1969	adapted for low chill desert areas
Fairtime	1968	late maturity (early October) with heavy yields
Nemaguard	1960	world's most widely planted peach rootstock
Springcrest	1969	very early maturity
Plum		
Friar	1968	high quality, large size, resistance to cracking
Blackamber	1980	large size, high box packout, extend Friar season

Like Snyder and Harmon before them, Weinberger and Loomis were an effective and productive team. They too investigated the seedless trait in grapes, and diversified the table grape and raisin germplasm through wide genetic crosses and germplasm introductions. During their tenure in Fresno, raisin growers were determining that the 'Thompson Seedless' cultivar was just a little too late in

maturity that in some years, early winter rains destroyed the crop as it was drying on the ground. Hence, Weinberger and Loomis began the search for an earlier-maturing raisin grape, and in 1973 introduced the raisin 'Fiesta.' 'Flame Seedless' was another widely popular introduction in 1973, providing consumers with the first seedless grape with crunchy/crisp flesh. To this day, 'Flame Seedless' is still the most widely planted table grape in California.

Embryo culture comes to the Peach Avenue Station

Both Weinberger and Loomis retired in the mid-1970s after two decades of productive breeding in stone fruit and grapes at the Peach Avenue Station. Immediately thereafter, Dr. David Ramming was hired to manage the breeding program. Dr. Ramming received his training at Rutgers University where he learned the technique of embryo culture in peaches. This technique was used to rescue and germinate small embryos from early ripening peaches that would not have otherwise been viable with typical seed culture. Dr. Ramming modified this technique for grapes and demonstrated that embryos from seedless grapes could be successfully cultured. This proof was needed before actively making seedless x seedless crosses and culturing the small developing embryos. With embryo culture assisted seedless X seedless crosses, a much higher percentage of seedless vines could be realized in the progeny.

Embryo culture has been used routinely since the mid-1980s in both stone fruit and grapes to improve breeding efficiency and rescue embryos that would otherwise abort. While labor intensive, embryo culture has been successfully used for the development of earlier ripening stone fruits ('Mayfire' nectarine, 'Spring Baby' peach) and both table grapes and raisins coming from seedless X seedless culture ('Scarlet Royal,' 'Sweet Scarlet,' and 'Princess' table grapes, 'DOVine,' and 'Sunpreme' raisin grapes).

Possible growth of the Peach Avenue Station

The Peach Avenue Station started out as a grape evaluation site, but slowly grew into an important breeding and postharvest quality center with a diversity of research projects. Office and laboratory space in the old buildings was completely full, and newer personnel had to make-do with 'temporary' space in trailers. And while the Station grew, the city of Fresno was growing as well. Located outside of and to the southeast of Fresno in 1916, the Peach Avenue Station had been surrounded by Fresno by the mid-1980s. Agricultural spraying of crop care products has never been a practice that nearby homeowners want to witness. And as urban density increased around the Station, complaint calls about agricultural sprays from unhappy nearby homeowners similarly increased.

In 1989 there was official discussion of acquiring 30 acres of vacant land to the south of the Peach Avenue Station and constructing a new laboratory center. Headquarters was onboard with the idea, and initial architectural sketches were made. The 30-acre parcel was acquired and improvements to the plot areas were begun immediately. The breeding program planted nursery stock for evaluation during the 1990 dormant season and with that effort, the property was officially in use.

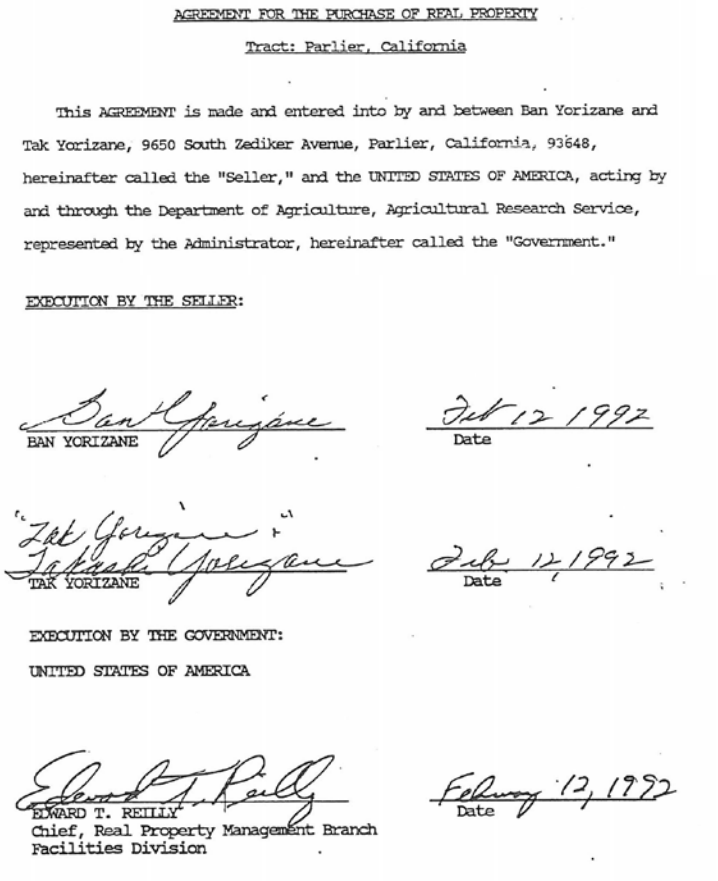
Unfortunately, Fresno had grown sufficiently in the southeast region that a new public school would be needed there for the local pupils. It was soon discovered that a new K-7 public school was being constructed just a half-mile south of the Station. This was somewhat of a final straw, and all parties knew that there would undoubtedly be continuous future difficulties with operating a center for agricultural research in such close proximity with schoolchildren. With that, plans for a new center at Peach Avenue were scrapped and other more suitable locations in the surrounding area were sought.

History of the location as seen from a plant breeder's perspective.

New property acquired in Parlier

Ban and Tac Yorizane were interested in the prospect of selling their agricultural property to the federal government. They were well established stone fruit and grape producers with an operation just outside Parlier, CA, and had been thinking it was time to retire from farming. Several local ARS personnel toured the property with the Yorizane brothers to learn about the farming history and examine the suitability of the location. Their farming operation consisted of 120 contiguous acres and two agricultural wells. Both soil and water quality were deemed adequate and plans were made for a property sale. The Parlier location became US government property formally on 12 February 1992 (Fig. 5), almost a full ten years prior to the official opening of the San Joaquin Valley Agricultural Research Center. Trees from the breeding program were first established at the Parlier location on 27 February 1992 (Fig. 6).

Development of the Parlier land began slowly. By contract, the Yorizane brothers were allowed to continue farming some of the property for several years as ARS began to develop other portions. It was not until 31 October 1995 that ARS finally took control of all property. At that point, Parlier was really just a field site as there were no offices or lab facilities. While it was a bit inconvenient, Peach Avenue personnel were relieved to know that change was going to happen and a site with abundant land, water, and permanent facilities for all personnel would eventually be prepared and ready for occupancy.



AGREEMENT FOR THE PURCHASE OF REAL PROPERTY

Tract: Parlier, California

This AGREEMENT is made and entered into by and between Ban Yorizane and Tak Yorizane, 9650 South Zediker Avenue, Parlier, California, 93648, hereinafter called the "Seller," and the UNITED STATES OF AMERICA, acting by and through the Department of Agriculture, Agricultural Research Service, represented by the Administrator, hereinafter called the "Government."

EXECUTION BY THE SELLER:

BAN YORIZANE — Feb 12 1992 Date

TAK YORIZANE — Feb 12, 1992 Date

EXECUTION BY THE GOVERNMENT:

UNITED STATES OF AMERICA

EDWARD T. REILLY
Chief, Real Property Management Branch
Facilities Division — February 12, 1992 Date

Fig. 5 Signing parties and agreement for sale of land in Parlier, CA, for establishment of the San Joaquin Valley Agricultural Sciences Center.

History of the location as seen from a plant breeder's perspective.

Fig. 6 First planting of nursery stock at the site of the San Joaquin Valley Agricultural Sciences Center. 27 February 1992.

Groundbreaking for the new Parlier facility occurred in the spring of 1998. A variety of ARS administrators, Parlier city officials, and area politicians participated in the event (Fig. 7). Construction commenced soon thereafter, but the new San Joaquin Valley Agricultural Sciences Center was not ready for dedication until the fall of 2000. Peach Avenue Station personnel began organizing their labs, offices, and farming equipment for the move while the finishing touches were being added the Parlier facility. The actual physical move from Fresno to Parlier took place in October 2001.

Fig. 7 Groundbreaking for the new San Joaquin Valley Agricultural Sciences Center, Spring 1998.