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Turpan: China's Prime Grape Producer

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China may not be a foremost viticultural country or a top wine maker, but it produces some the world's best grapes, from Turpan, a basin on the famous Silk Road.

The basin drops 156 meters below sea level amid the arid Gobi desert that covers much of the country's vast northwest. It lies 140 kilometers east of Urumqi, capital of the Xinjiang autonomous region.

On a 1988 trip to Turpan to evaluate grape quality, a group of grape experts from California judged Turpan's 'Wuhebai' grape (white seedless) as "the sweetest in the world." With a sugar content of 20 to 24 percent, the 'Wuhebai' grape is much sweeter than grapes grown in California. Turpan's 'Wuhebai' was first introduced to California in 1870 and named 'Thompson's Seedless.'

The 'Wuhebai' grape, which covers more tha 80 percent of Turpan's total grape acreage of 11,760 hectares, is important for many reasons, especially its suitability for raisin processing. Compared with other varieties of grapes, 'Wuhebai' grapes are firmer, sweeter, and have less juice. Their yield—45 tons per hectare—is three times that of other varieties. Often compared to pearls, the yellowish white grape is also good to eat fresh.

Besides this white seedless grape, Turpan produces more than 500 other grape varieties, according to the Turpan-based Xinjiang Grape and Melon Research Center. Local people prefer 'Hongputao' (red grape) and 'Manaizi' (mare's nipple) varieties for fresh eating. The 'Hongputao, is large, egg-shaped and bright red, while the 'Manaizi' is long and yellowish. With thin skins and few seeds, these varieties are crisp and juicy. But because of low yield and difficulties in transport and storage, acreage devoted to them is small.

Many rare grape strains grow in Turpan. For example, the 'Suosuo' grape, which is round, purple-red, seedless and tiny, is used only as an ingredient for medicine to cure measles.

If Turpan grapes are transplanted to other parts of China, their quality deteriorates, according to Li Zhichao, a senior horticulturist in the Turpan Agricultural Department. He said the grapes will become sour and smaller in size, with more seeds.

Favorable Natural Conditions

The unique quality of Turpan grapes is owed to the unique natural conditions of the basin area.

Turpan, the world's second lowest depression after the Dead Sea in the Middle East, is extremely hot. Summer lasts five and a half months with daily temperatures exceeding 35 degrees Celsius. As the frost-free period in the basin is as long as 220 days a year, the annual accumulation of heat effective for crop growth can reach as high as 5,424 degrees C. "The heat accumulation in Turpan is more than sufficient for viticulture," said Li Zhichao.

Sunlight in the basin is also abundant. The sun shines in Turpan 3,000 to 3,200 hours a year, one-third more than in other areas on the same latitude, and its solar energy averages 655 kilojoules per sq. cm. "Vines like sunlight," Li said. "In the sunlight, the leaves of the grapevines create large amounts of organic substances by photosynthesis, thus raising sugar content in the fruit."

Precipitation in the basin is small, averaging 16.6 mm a year, while evap-

oration is as high as 170-200 times the rainfall. "Dry weather helps increase flowers' fertilization rate, promote the maturing of the fruit, and reduce plant diseases and insect pests," Li said. "It's also good for the processing of grapes."

"Because of these superior natural conditions, grapes grown in Turpan are better than any grown elsewhere in the world including the littoral areas of the Mediterranean, the home of grapes," Li Zhichao said.

Because of these superior natural conditions, the Chinese government in 1979 designated Turpan as China's only grape production base supported by the central government and equipped with advanced technology and research. Since then, grape production in Turpan produced 117,000 tons of grapes, 4.1 times the output in 1979, or 18.2 percent of the national total. Of the total output, about 90,000 tons were turned into raisins. The rest were eaten fresh or processed into wine, canned grapes or juice.

Now, vineyards are everywhere, especially in the rural areas. Even in the city of Turpan, vines supported by iron trellises have been planted along major streets. Almost all the urban households have one or two trellises in their courtyards.

Yet due to storage and transport difficulites, only a small amount of Turpan grapes leave the area. In 1989, for instance, some 6,000 tons, or 5 percent of Turpan's total grape output, were sold in other Chinese provinces.

Exporting the fresh fruit to the international market is another challenge. In 1989 Turpan exported only 43 tons of fresh grapes, less than 0.04 percent of the total output, to Hong Kong, Japan and Pakistan.

Thus, Turpan has to devote major efforts to grape processing, officials say. Currently, there are 30 grape processing factories in the basin, run by the State or local collectives. In 1989 they turned out more than 20,000 tons of raisins, or 75 percent of the national total, with the remainder supplied by Liaoning, Hebei and Shandong provinces on the Bohai Sea coast. During the year Turpan also produced 9,400 tons of canned grapes, 5,420 tons of grape wine, and 6,500 tons of grape juice. These products are valued at 155.4 million yuan (US$33 million), accounting for 42.3 percent of Turpan's total industrial output value.

Grape production in Turpan is expected to develop further in the coming years. According to a plan worked out by the Turpan Agricultural Department, vines will be planted on 20,000 hectares of cropland and 250,000 tons of grapes are expected annually by the year 2000. The figures are respectively 1.7 times and 2.1 times the present acreage and output.

Selecting Late Flowering Apples

Seeds of late flowering apple genotypes require much longer exposure to chilling temperatures than those of early flowering genotypes and they germinate over a much longer period. In progenies that exhibit much variation for the two traits, seed germination time was correlated with time of leafing out of the resulting seedlings, and could be used to select for delayed budbreak. However, selection would be ineffective when little genetic variation for seed germination and budbreak is present. Leafing out ratings in the nursery in the second year were highly correlated with those in the third year, indicating that selection for late leafing in the nursery during the second year would be more effective than selection based on seed dormancy, especially in progenies exhibiting little genetic variability for this trait. Breeders can effectively use both relationships by first eliminating early germinating seeds and then eliminating early leafing seedlings. (From Mehlenbacher and Voordeckers. 1991. J. Amer. Soc. Hort. Sci. 116:565-568)