

IDFTA Compact Fruit Tree: Vol. 31, No. 4

Werth Quote: Three countries should be observed carefully as far as fruit cultivation goes, though for different reasons: China, Japan and Turkey.

The Apple in the World: Growing, Storage, Marketing

The following six articles were presented at INTERPOMA, the First European Trade Fair and Conference on Apples, in Bolzano, Italy, June 4-7, 1998. The articles are reprinted from *Obstbau Weinbau* 35(5), June 1998.

Apple Production in Italy and the South Tyrol, Acreages, Varieties and Prognoses

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The Italian apple growing area in 1995 was 72,693 ha (179,550 acres). The acreage diminished by about 10% since the 1980s because many orchards were abandoned in the Po Valley. While there were still 33,000 ha apple orchards in the Po Valley regions of Emilia Romagna and Veneto in 1984, the acreage there fell to 20,000 ha in 1995. A slight increase is expected only in the Alpine regions.

Nationwide the apple growing area will continue to decrease in Italy. After all, for the current EC orchard abandonment program Italy has entered 3,650 ha. The center of the Italian apple production is situated in the northern regions, where apples are cultivated in the alpine valleys and in the southern foothills of the Alps. The big apple production areas are the South Tyrol with 18,000 ha, Trentino with 12,300 ha, Piemonte with 6,080 ha and Friuli-Venezia Giulia with 1,250 ha. In the region Lombardia apple orchards can be found in the Valtelina (Province of Sondrio). In central and southern Italy the apple production is situated in the foothills of the Apennines.

PRODUCTION

The Italian apple production averages approximately 2,000,000 t per year. Thus Italy, like France, accounts for a quarter of the annual EC production. At present Italy ranks seventh among the apple producing countries in the world. The Italian production of 30 t/ha corresponds to the

European average. While the South Tyrol produced 42 t/ha on an average in the 1990s, the yields/ha are little more than 20 t in the region of Campania.

APPLE VARIETIES IN ITALY

Golden Delicious has remained the leading variety with 45% of total production. This variety is expected to keep its dominating position in the near future, although it is slightly decreasing. Red Delicious (16%) will keep the second position. A trend toward spur types can be noticed. Rome Beauty will soon make up less than 10% of the total production. The remaining varieties do not exceed 10% each. It is easy to predict that Gala will soon hold the third position.

THE SOUTH TYROL

The elevation of the orchards and the climatic conditions differ widely in the South Tyrol. Two-thirds of the apple growing area is situated on the floor of the Etsch Valley, one-third is on the hillside. Orchards can be found at over 1,000 m (3,300 feet) above sea level (in the Vinschgau). The temperatures in the whole apple growing area seldom fall below -10°C (14°F). In the summer temperatures sometimes exceed 35°C (95°F). In Schlanders (715 m above sea level) the annual average temperature is 9.8°C, in Bozen (250 m above sea level) it is 12.1°C. The average rainfall per year is 600 mm (24 inches) in the Vinschgau and 800 mm (31.5 inches) in the Etsch Valley. Today most of the orchards are supplied with overtree sprinklers for spring frost protection and irrigation. The soils are for the most part quite light textured, permeable, sandy loam soils with a pH of 5.5 to 7 and with a fairly balanced nutrient content. These rather light-textured soils and the micro-climatic differences offer ideal natural conditions for the cultivation of a wide range of varieties.

TRENDS IN APPLE PRODUCTION

In the South Tyrol, Golden Delicious is expected to decrease a little. It would certainly be an advantage for the whole South Tyrolean fruit industry if this variety were substituted by more suitable ones in low elevations. The share of Red Delicious will remain stable. With this variety a unification of the various strains and a trend toward spur types with brighter colors and improved shapes are discernible.

Rome Beauty will lose ground due to the increasing age of the orchards and the relatively low gross income per ha.

Granny Smith is characterized by high productivity and elevated percentage of first rate fruits. This variety has been appreciated by the growers since the 1970s for its high yields/ha and it will

keep its share in the South Tyrolean production. With Jonagold the light red, striped strains are prevalent. Recently Jonagored has been considered for new plantings. This variety has a certain importance for our higher elevations. It is to be hoped that the European "Jonagold Recession" will not persist, otherwise the profit margin of this variety will decrease in comparison with Golden Delicious.

In the next years Gala will gain the third or even the second position in our production. Also Braeburn will increase considerably. Fuji has remained stable, certainly as a result of its alternate bearing habit and the wide range of clones available, which makes the choice difficult for the growers.

It remains to be seen whether Fuji and Pink Lady will increase in the following years.

FROM 300 TO 3,000 TREES/HA

Up to 1970, our orchards were dominated by large, round-shaped, multi-leader trees on seedling rootstock (300 to 400 trees/ha). Today we prefer the slender spindle on M.9. The preferred planting system is the single row with a tree spacing of 3.2 to 3 m x 1.1 to 0.8 m (10.5 to 9.8 feet x 3.6 to 2.6 feet). This corresponds to an average tree density of 3,000 trees/ha (1200 trees/acre). Depending on the location, there are also several other planting systems such as terraces and special bed systems.

The fruit area has expanded by approximately 1,000 ha in the last decade. This happened mostly at the expense of pastures in the Vinschgau, in the Eisack Valley and on the Ritten, but there were also some vineyards converted to orchards.

As the acreage available for fruit growing is limited, the attempts to increase the already quite high yields/ha will be continued.

The assumption that the South Tyrol will produce 1,000,000 t apples very soon, which would account for half the Italian production, is realistic. This continues a trend of increased production during the 1990s (Figure 1).

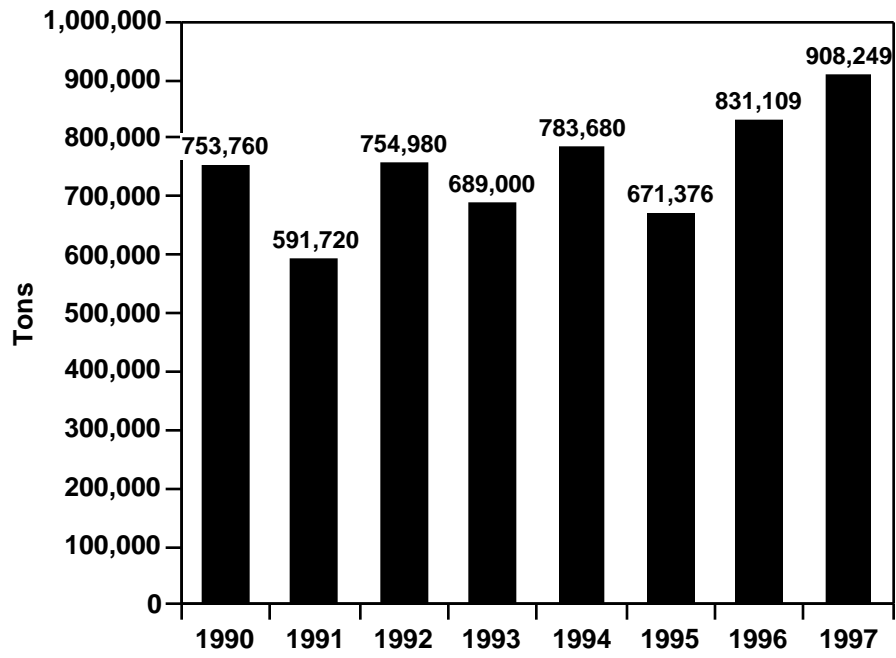


Figure 1. South Tyrolean apple production, 1990-1997.

Apple Production in Central and Eastern Europe

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The central and eastern European region includes 19 countries between 44 and 70 degrees north latitude (Table 1). The total area equals 83% of the area of Europe with 344.5 million inhabitants (47% of Europe's population). Approximately 28% of this population lives in the country.

There are very great differences between the countries in size, climate, and soil, as well as in the mentality and income of the inhabitants. The agriculturally cultivated area is 347 million hectares, or 18% of the total area. The percentage of cultivated area is over 65% in the Ukraine and Hungary and in Russia only 0.01%.

The total area of fruit production (excluding vineyards) is about 3.5 million hectares, or 1% of the cultivated area. In Moldavia the percentage is about 6% and in Russia only 0.4%. The orchards in Russia and the Ukraine equal 48% of the total fruit area of all 19 countries. I estimate the area of the apple orchards at about 2 million hectares (4.9 million acres).

The average apple production in 1996/1997 was about 8.6 million tons, that is, under 50% of the total European production. In Russia, Poland and the Ukraine 5.7 million tons of apples were produced. On the average, that is 25 kg (55 lbs.) of apple production per capita, in Moldavia 81 kg, and in Albania 4 kg. In 10 countries, less than 30 kg per capita were produced. Russia is and will remain the largest importer of apples, followed by Yugoslavia, Romania, the Czech Republic, Slovakia, Bulgaria, Bosnia and Herzegovina, Latvia, Albania, Croatia, and Estonia. The exporters are Poland, Slovenia, Hungary, and Moldavia. The Ukraine, White Russia, Lithuania and Macedonia can satisfy their own demand.

The most modern area of apple production is in Slovenia. Under very good climatic conditions, mean temperature of 9°C (48°F) and 1,100 mm (43 inches) precipitation, they produce average crops of over 40 tons per hectare. In Russia, on the other hand, they produce 3 to 5 tons per hectare, in Hungary 20 to 25 tons per hectare and in many other countries less than 10 tons per hectare. The main reasons for poor production are extensive plantings and insufficient care of the trees. The capital needed to buy the inputs of production is lacking. The assortment of varieties is outdated. Except for Slovenia, Hungary and Poland, local and older varieties predominate which no longer find a niche on the normal market. The quality is very low. Another problem is the lack of storage facilities. In many countries, only 20 to 30% of the fruit can be stored, mostly in

natural storage. Cold storage is a rarity. Only Slovenia, Poland and Hungary have CA or ULO storage.

In countries with extensive cultivation, apple production is very profitable. The production price per kg is approximately 100 to 150% higher than the production costs.

In Hungary and Poland, the difference between costs and price is small. In Hungary, for a crop of 20 to 25 tons per hectare, the production costs are about 25 forint/kg and the production price is 30 to 40 forint/kg. In Poland the production costs amount to 0.5 to 0.6 zloty/kg and the production price is 0.7 to 0.9 zloty/kg.

In all 19 countries there is considerable discussion of new developments in apple production. New development programs have been initiated to encourage increases in marketable apple production. In the Czech Republic, Hungary and the Ukraine there is corresponding government help.

In Slovenia, Poland and Hungary there are new orchards similar to those in western Europe with 2000 to 4000 trees per hectare (809 to 1619 trees/acre), M.9 and marketable varieties. In countries with a harsher climate, the new orchards are planted with about 1000 trees per hectare (405 trees/acre) on medium-vigor rootstocks and frost-resistant varieties such as Spartan. In addition, there are new local varieties.

The modernization is in full gear in Slovenia, and it is progressing relatively fast in Poland, Hungary, and the Czech Republic. In the other countries this process is just starting due to lack of money and necessary specialized knowledge. It could take another 10 years. Another problem is lack of good quality nursery stock.