

The Latest Apple Production Techniques in South Tyrol, Italy

Kurt Werth

SK Südtirol (Variety Innovation Consortium South Tyrol), Terlan, Italy

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Geographically the South Tyrol region of Italy is situated in the middle of the European Alps. It is on the south side of the Alps and has the advantage of an alpine climate with Mediterranean influences. It is a central location to markets in both the north and south of Europe.

Fruit production is in the Etsch Valley and ranges from an elevation of 220 m (720 ft) up to 1,000 m (3,280 ft) in the Vinschgau. Although in Italy, South Tyrol's population is mainly German speaking, as the area was part of Austria up until 1919.

The fruit production area is one of the most intensive in Europe, if not in the whole world. Family farms, covering about 40,000 acres (16,188 ha), are small parcels, typically 10 acres (4 ha), intensively cultivated. Ninety percent of the trees are on M.9 rootstock with an average of 1,300 trees/ha (526 trees/acre). The rate of changeover is about 5% a year. The main variety is still Golden Delicious but there is rapid changeover to new varieties such as Gala, Braeburn, Fuji and Pink Lady.

STRENGTHS AND WEAKNESSES

The strengths of the South Tyrol apple industry are:

1. Intensive culture is a priority since acreage is limited.
2. Many farmers, 60%, are part-time.
3. Italian government is pro-agriculture.
4. There is a minimal tax load for farmers.
5. The local government is competent and South Tyrol as a region in Italy has political autonomy.
6. A "closed farm" old Austrian law protects farm property from being divided.
7. There is a history of 40 years of European Union support for agriculture.
8. Cooperative grower organizations have a long tradition (43 cooperators market 90% of South Tyrolean apples).
9. Credit at local banks is possible.
10. Three umbrella organizations of cooperatives (VIP, VOG and Fruttunion) are a prerequisite for European Union support.
11. It has a favorable climate in an alpine area.
12. There are well-organized institutions for research, extension and education.
13. Excellent specialized journals are produced for the industry.

To hit the profitability bull's eye, growers must increase the gross income through investing and improving production techniques rather than by reducing costs!

14. South Tyrol has a central location in Europe and a good balance between domestic sales (Italy) and export to Europe.
15. A single plant is used for processing fruit.
16. It is a region of domestic tranquility and full employment.

The weaknesses of the industry are:

1. Farm units are too small.
2. The cooperative mentality means growers have little sense for business practices.
3. The cooperators have little clout with the major supermarket chains.
4. A monoculture of apples means ecological and economic limitations.
5. Worldwide apple profitability has lost ground as modern cultivation methods are used and overproduction results.
6. Many farms cannot keep up with new investments and technology with the increased tempo of change.
7. Just producing apples is not enough, orchardists must also be entrepreneurs.

To hit the profitability bull's eye, growers must increase the gross income through investing and improving production techniques rather than by reducing costs! It is easier to earn \$10,000 more by investing in good techniques than save \$1000 on costs!

In the past, apple trees were large and had a round canopy. A relatively rapid changeover occurred to high density with the introduction of M.9 rootstock. Average orchard spacing is now 10 x 3 ft (3 x 1 m). Cement posts are used for support with 4 wires to a height of 10 ft (3 m).

In the modern orchard of South Tyrol, the goal is not to produce wood but to produce apples. The goal of the training system is to develop a tall, slender spindle with very weak fruit wood at the top, with moderate vegetative growth and the highest possible fruit production. Early production in the second leaf is generally 350 boxes/acre, in the third leaf is 8 to 12 kg/tree (600 to 900 boxes/acre) and full production in the fourth leaf is 15 to 20 kg/tree (1,000 to 1,400 and sometimes up to 2,000 boxes/acre).

In the course of the last three decades, the average price per kilogram, adjusted for inflation, has been reduced by half. Average price in Euro/kg was 0.72, 0.50 and 0.36 for the '70s, '80s and '90s, respectively. Major fluctuations are dependent on the entire European production. At the same time, total crop production has nearly doubled in South Tyrol through the use of intensive plantings. Average yield (MT/ha) was 26, 36 and 45 in the '70s, '80s and '90s, respectively. The small family farms were able to remain in existence only by intensification and changing over to new varieties. In this way, gross income could be relatively well sustained. Other fruit production areas in Europe which did not keep up with these changes have disappeared from the scene.

Special significance can be given to the changeover to new varieties. About every five years, new varieties have been introduced. Introduced in '80 to '85 were Jonagold and Granny Smith, in '85 to '90 Granny Smith and Gala, in '90 to '95 Gala and Braeburn, in '95 to 2000 Braeburn and Fuji and since 2000 Fuji and Pink Lady.

When the average price per kilogram in the '90s is compared to that of the last three years, varieties such as Braeburn, Fuji and Pink Lady have held their ground relatively well. Golden Delicious, our main variety, has lost 35%, Red Delicious has lost 58%. Pink Lady and Fuji are holding their own. Gala is beginning to lose ground. An orchard of Golden Delicious with 40 tons/acre brings the same gross income as a Braeburn orchard with 25 tons/acre or a Fuji or Pink Lady orchard with 20 tons/acre. If you include the production costs, our Golden Delicious are no longer profitable. In the U.S. the same situation may be occurring for Red Delicious. The goal must be to remove obsolete varieties and plant the best paying ones.

TREE MANAGEMENT

In the future, he who swims with the masses will be the loser! He who distinguishes himself from the others will remain in balance! The winner is a specialist! Having the correct variety alone is not enough. The correct cultivation techniques are necessary to be successful. The most important point in cultivation is the right "feeling for physiology." By nature, trees tend to grow upward. It must be our goal to counteract this tendency during the entire life of the tree. This means to do everything possible in order to break the vegetative growth of the tree and to promote fruit bud production and the resulting fruit set. Only a "calm tree" regularly produces good quality fruit. A vegetative tree produces wood. A calm tree is a guarantee for regular cropping.

TREE QUALITY

The most important factor for a good beginning of an orchard is to use the best possible plant material available. In the past, newly planted trees have had few branches. Trees with few feathers must not be planted anymore because they take 2 to 3 years longer to come into production. Trees of the best quality have many feathers and are at least 6 ft (2 m) tall. The plant material must be certified and virus free. In South Tyrol, only M.9 trees are considered, all other rootstocks are only a disadvantage. The best M.9 clone is NAKB T337 from Holland. MM.106 can be considered only for spur types (Red Chief Delicious).

The ideal young tree is a "knip" (cut) tree. This is a 2-year nursery tree that is headed at 20 inches (50 cm) before growth begins in the nursery in year 2. Only a single vertical shoot is retained and this shoot branches extensively. It has many wide-angled feathers at the right height. With this type of tree, only shoots at the tip which are too steep are removed at planting. Feathers which are too low are not favorable and must be removed. Every cut promotes vegetative growth and valuable "capital," that is, potential fruit, is lost.

The best way of restricting vegetative growth is to produce apples.

TREE CARE

In the orchard, the leader must be trained upward as slowly as possible and must never be shortened. Where it is necessary to cut the leader in order to produce side shoots, trees should never be planted. Vigorous apical growth can be slowed or stopped if the tip is bent down for a few weeks when active growth begins and then is left to straighten again only when the side shoots are at least 10 cm (4 inches) long. This promotes the formation of fruit buds and fruit set. The best way of restricting vegetative growth is to produce apples.

Notching of the central leader, that is, a cut above the bud at the beginning of the growth period, promotes growth of side shoots. This is a method which is advantageous in trees with strong growth.

High grafting and high planting (leaving a long rootstock shank above the soil) reduce growth and promote fruitfulness. To plant high, it is necessary to have adequate irrigation.

The "Fuse Axe" trellis system (an idea from France) has two extra trellis wires extending down the row, one on each side of the tree at its widest point. The two wires are 50 cm (1.5 ft) from the trunk and 1 m (3 ft) above the soil. These extra wires are helpful to tie down steep shoots quickly and easily. Side shoots carrying fruit can lie down on the wires in the fall, preventing them from touching the soil.

Stripping (tearing off) of strong competition shoots prevents the growth of steep water sprouts. Pruning, on the other hand, promotes new shoots. Painting the strong tips with highly concentrated NAA causes growth shock and stops any further strong growth.

GROWTH CONTROL

"Bending" is always advantageous and is a measure which pays off. The stronger the growth, the better the promotion of buds and fruit set.

Thinning of fruit alone is not enough for some varieties to prevent alternate bearing. With Fuji, it is imperative to bring growth to a standstill 60 to 70 days after bloom. Side shoots must end in a blossom bud. This can be attained with spraying NAA, Ethephon or Apogee.

Problems with excessive growth and too low a crop load can be solved by root pruning. A special root cutting device for the tractor is necessary. The elimination of roots stops vegetative growth of the tree and promotes blooming. In some cases, growth can be reduced by massive notching of the trunk.

Strong branches at the top must always be eliminated. Only weak fruit-bearing wood should remain at the top. Strong vertical shoots will still be vertical and have less fruit at the end of the season. Weaker side shoots are calmer and more fruitful. The ideal top should have calm tips, good fruit set and low vegetative reaction. Lateral branches should never be too large in comparison to the main trunk. Large branches should be removed earlier, before they begin to be too competitive. Strong shoots must be removed at the base, not shortened. Only hanging fruit-bearing wood should or must be shortened. Strong pruning leads to a growth reaction and requires even stronger pruning. Therefore, no pruning is better.

In summary, modern fruit growing must be a combination of the correct investments and correct production techniques. It is not enough to produce just apples. We have to produce the best quality of the right variety with the right techniques.