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# 'Jonagold': An Apple for the 21st Century

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It is hard to dispute Way's comment (7) that the Cornell apple breeding program has produced a cultivar, of "unsurpassed eating quality." Excellent consumer scores have been achieved by 'Jonagold' in comparison to traditional cultivars (3). 'Jonagold,' a cross of '*Jona*than' pollen with '*Gold*en Delicious' as the female parent, originated in 1943 at the New York State Agricultural Experiment Station, Geneva, and was named and released in 1968 (7). The success of 'Jonagold,' especially in the European markets, can be traced to specific cultivar characteristics matching consumer preference. This review will discuss 'Jonagold's' horticultural characteristics and its future in world apple production and marketing.

## World Production

'Jonagold's' acceptance as a new cultivar in the country of its origin, the United States, has been slow. However, it is beginning to appear in apple planting trends statistics. In the apple state of Washington, 30,000 trees of 'Jonagold' were planted in 1987, constituting 2% of new plantings (2). But it is in Europe where 'Jonagold' production has become substantial (Table 1). Apple production in this continent has shifted from warm to temperate regions due to consumer preference of cultivars such as 'Jonagold,' which can be grown well only in cooler climates (9). In 1986 Winter and Welte (9) reported findings regarding trends of 'Jonagold' production in Western Europe. This production within the EEC has increased by two hundred percent during the period 1983-1988, and is still expanding. In Belgium 'Jonagold' has already become a main cultivar, comprising over 10% of the total crop. 'Jonagold' has been identified as a new "star" cultivar in the South Tyrol province of Italy (3), an important point, as Italy has the highest capacity of apple production in the EEC. In West Germany, 'Jonagold' is reported to be the most widely planted new apple cultivar, while in the Netherlands, it is already one of the main new cultivars. In the United Kingdom 'Jonagold' was listed among 10 promising new apple cultivars in 1979 (1). Modest plantings were reported in this country and it was noted that this cultivar was best grown where fruit size had been a problem.

Japan now ranks ninth in world apple production and 3% of its production is of 'Jonagold' (6).

## Horticultural Characteristics

As 'Jonagold' plantings expanded, several mutants have been reported and these include 'Jonagored' from Belgium and 'Jonica' from West Germany (3). It is likely that these or similar superior mutations will be further developed.

*Tree.* The 'Jonagold' tree is triploid. It tends to be medium in size, moderately vigorous, with wide angled, strong crotches like 'Golden Delicious' but a general configuration which is more spreading, like 'Jonathan.' A distinguishing feature is a bark which is smoother

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**Table 1. Production of Jonagold apple by country.**

| Country | Year | Area (ha) | | Production Metric tons | % of total or of each country's production | Literature cited no. |
|---|---|---|---|---|---|---|
| | | Bearing | Non-Bearing | | | |
| Belgium | 1986 | — | | 50,000 | 10.0 | 3 |
| Germany (FRG) | 1982/83 | 622 | 495 | 10,300 | 1.3 | 6 |
| | 1985/86 | — | — | 16,500 | 2.7 | |
| Italy (South Tyrol) | 1986 | 340 | | 11,660 | 2.0 | 3 |
| Netherlands | 1980/81 | — | | 2,000 | 0.3 | 6 |
| | 1985/86 | — | | 21,000 | 7.0 | |
| EEC (12) | 1986 | — | | 116,000 | 1.4 | 3 |
| Japan | 1985/86 | — | | 27,300 | 3.0 | 6 |

and a lighter shade of gray than that of most cultivars (7).

*Fruit.* The fruit are round-conic, large (mostly 75mm) with long, thick pedicels (7). Its skin is thick and smooth, with small gray and green lenticels. The ground color is golden-yellow with some green tinges. The overall color is orange red, the amount of red skin color varying with strain. 'Jonagored' from Belgium for instance (see above), is a totally red strain. Research in England has shown that winter pruning followed by summer pruning, particularly in August, improved fruit color and reduced fruit size, a noted advantage with this cultivar (8). The fruit flesh is creamy white in color, crisp and juicy, with a rich and sweet flavour. In quality tests of 28 mid to late season apple cultivars growing in Norway, 'Jonagold' obtained very high flavour scores even in those years when underdeveloped fruits were produced (5).

*Pollination and fruit set.* In Ontario, 'Jonagold' is a mid-season bloomer and has been adequately set by similar season cultivars. This tree produces spurs freely and appears to set flower buds on new wood. Since it is a triploid, its pollen is not viable so a third cultivar will be necessary. Sometimes fruit set is heavy and can lead to biennial bearing. Irregular bearing should not be a problem since crop load and fruit size are easily regulated with chemical thinners. Ogata et al (4) have implied that 'Jonagold' can be thinned with carbaryl applied 10 to 14 days after full bloom.

*Productivity and rootstocks.* The limited reports of 'Jonagold' trials show that it is is productive. Way (7) claimed that it was very productive over a 10 year period, outyielding 'McIntosh' by 20%, while exhibiting excellent orchard behavior. For consistent yield, pollination requirements must be met and biennial bearing controlled (see above). In a cultivar/rootstock trial in Japan (4) 'Fuji' yielded higher than 'Jonagold' on M.27 and M.26 rootstocks but was similar on M.9a.

*Maturity, storage and marketing.* 'Jonagold' is a late season apple, harvested about the same time as 'Delicious,' at about 147 days after full bloom, which infers limited commercial production in short growing season countries, such as Norway (5). The fruits adhere well to the tree after they have reached harvest maturity. It stores well in cold storage at about 0°C without rot or shrivel for up to 6 months (7). Shelf life after storage is usually better for 'Jonagold' than other cultivars. It is a dual purpose apple with its high quality in the fresh market trade being matched with processor demand.


**Figure 1. 'Jonagold' fruit are large, round-conic in shape, and overall color is orange red.**

## The Future

'Jonagold' is unquestionably becoming a prominent member of a new class of apple cultivars, which include other bred cultivars such as 'Mutsu' and 'Fuji.' This is due primarily to consumer appeal followed by high market place value. However, this does not mean that 'Jonagold' does not have shortcomings. Its cool climate requirement dictates its growing environment and exclusion from many of the world's major apple-growing regions. In spite of the shortcomings, indications, particularly from Europe, are that 'Jonagold' could well become a worldwide contender by the next century.

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