



■ THE PROBLEM ADDRESSED

Economic importance of a sector rich in cultural and traditional values

One of the aims of TROPICSAFE is to evaluate the impact of the solutions proposed to manage grapevine yellows, the phytoplasma-associated diseases considered one of the most important of the world grapevine sector. Given the importance of viticulture in traditional areas and the entry of new wine-growing countries into the global market, the development of specific disease management strategies, and the introduction of innovative solutions to detect and monitor its associated pathogens, are highly relevant. The analysis of grapevine sector in Chile, Italy and South Africa considers and compares economic and social aspects, such as production, acreage, yields and/or import-export (data of the International Organization of Vine and Wine, OIV). In these three countries, viticulture has a long tradition, it is a part of the landscape (such as the Prosecco area in Italy, recognized by the UNESCO world heritage list) and the cultivation of grapevines plays an important economic role, not in terms of surface, but especially in terms of production and export of wine.



- Vineyards in Italy (Conegliano and Valdobbiadene, Prosecco wine producing areas, Unesco's world heritage) (N. Simboli).

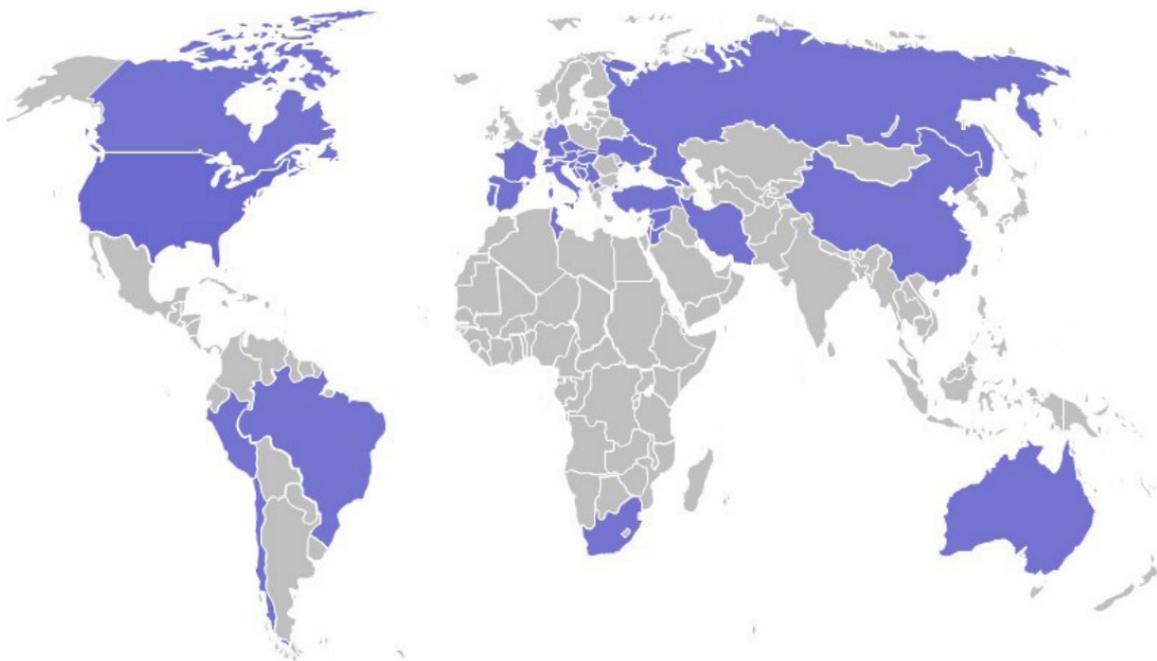
■ LATEST RESEARCH RESULTS

The importance of grapevine production

Grapevine (*Vitis* spp.) is a major crop, which has a worldwide high socioeconomic importance, but is also susceptible to several diseases, like yellows. According to the OIV data (estimates), in 2019 the total surface cultivated with grapevine in the world reached 7.4 million ha (-0.1% compared to 2018), with a global wine production of 260 million hl (-7%). Despite this negative variation, the world wine consumption slightly increased, reaching 244 million hl compared to 2018 (+0.1%). The United States of America confirms their first position in the ranking of consumers, followed by France and Italy.



In Europe, a positive trend in wine consumption is estimated for Italy, Spain and Germany, while France has experimented a slight decrease. The total export of wine in 2019 was 106 million hl (+1.7% compared to 2018). In terms of volume, the biggest exporters are Italy, Spain and France that together exported 571 million hl, 54% of the world market. Positive variations have been recorded in Italy (+10%), Spain (+7%), New Zealand (+5%), Chile (+3%). A decrease in export volumes in 2019 was observed in Australia (-13%) and South Africa (-24%). The global market value amounts to 31.8 billion euros. France, Italy and Spain are the main exporters also in terms of value in 2019 (9.8, 6.4 and 2.7 billion euros respectively), accounting for 60% of the total value of wine exported in 2019. France, Italy and Spain are the main exporters also in terms of value in 2019, with 9.8 billions euros, 6.4 billions euros and 2.7 billions euros respectively. These three countries account for 60% of the total value of wine exported in 2019. Compared to 2018, an increase in value with respect to 2018 was recorded in New Zealand (+8.3%), France (+4.6%), Italy (+3.4%), Portugal (+2.5%), Chile (+2.1%), Argentina (+1.2). A decrease in value of exports was recorded in South Africa (-11.0%), Spain (-8.0%) and Germany (-0.5%).



- Presence of different species of '*Candidatus Phytoplasma*' associated with grapevine yellows in the world (Assunta Bertaccini, unpublished).

■ THE TROPICSAFE RESEARCH AND DEVELOPMENT ACTIVITY

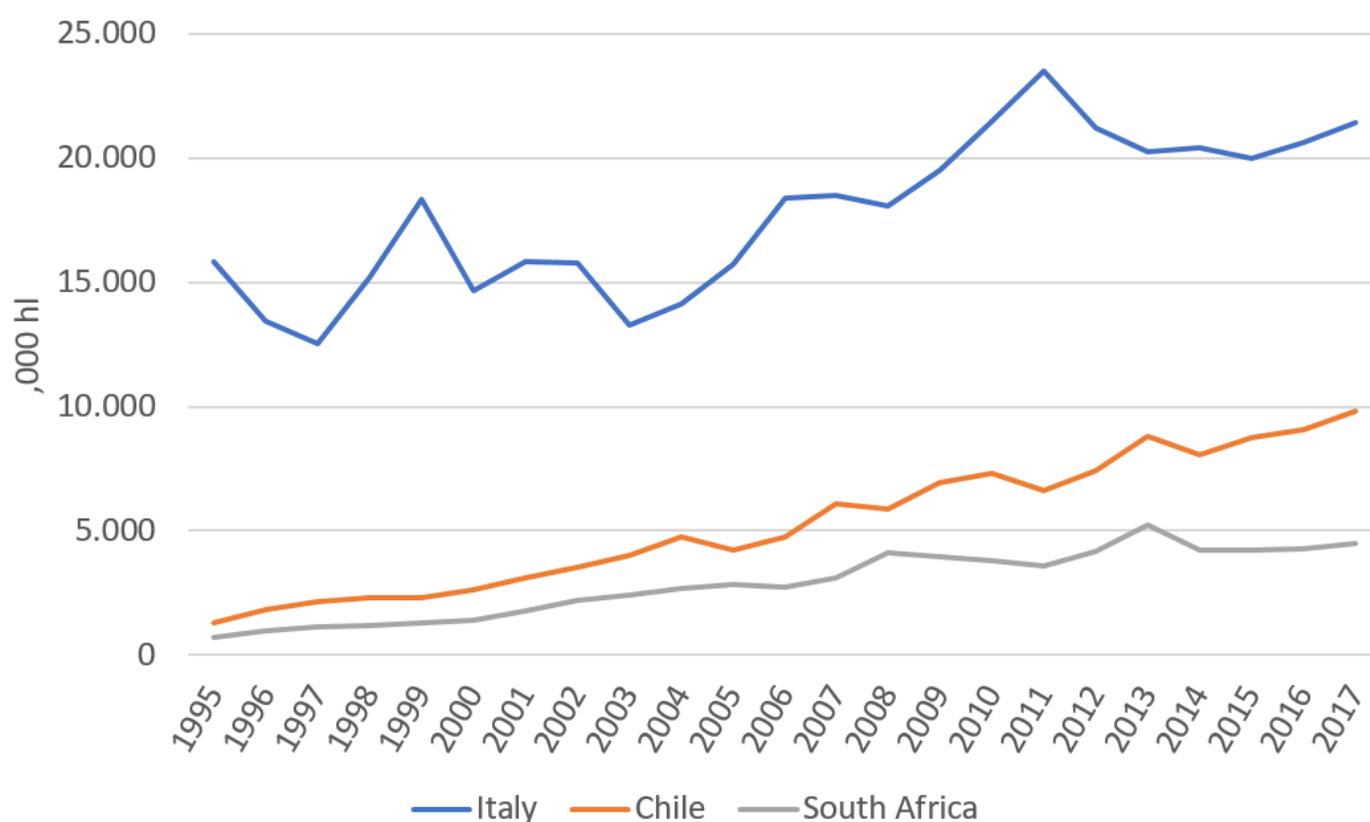
New entries in the global market next to the traditional wine-producing countries

Chile: The grapevine sector in this country has had a great development in the last 20 years and nowadays Chile can be considered as one of the key players in the international wine scene, dominated traditionally by European countries. According to OIV data, during the period 1995-2017 the total surface devoted to vineyards increased, reaching the extension of 213,452 ha in 2017 (+74.8%; decreased in 2018 compared to 2017: -0.1%) with a production of grapes of almost 2 million tons (+30.8%; increased in 2018: +25%). The growth in vineyards has been followed by the development of the processing phase: in 2017 the production of wine is 9.5 million hl (+200% compared to 1995; increased in 2018: +36%), which feed the global export, estimated at 9.4 million hl (-1% in 2018), six times more than the value recorded in 1995.



Italy: Viticulture in Italy has a long tradition. The country has a leading position thanks to a productive and diversified viticulture, characterized by a vast reserve of native grapevine varieties, the development of nursery activities, and the competitive prices of the products in the market. Following the European general trend, in Italy the area under grapevine cultivation and the production are decreasing: the data from 2017 shows an area of 696,649 ha (-24.9% compared to 1995; increased in 2018 compared to 2017: +0.9%), producing 6.9 million tons of grapes (-18.8%; increased in 2018: +25%). The production of wine is 42.5 million hl in 2017 (-23.7% compared to 1995; increased in 2018: +29%), however, Italy maintains its key role in the international market, with a strengthening in the export of wine (+35.3%: decreased in 2018: -7%).

South Africa: Together with Chile, South Africa is one of the new entries in the international market of wine. Vineyards are increasing in the country (the average in 2017 was 127,554 ha, +23.8% compared to 1995; decreased in 2018: -2%) and also the production of grapes (2 million tons; +52.3%; decreased in 2018: -10%) and wine (10.8 million hl, +29.5%; decreased in 2018: -12%). The development of internal production has had an impact on the international market, with a significant growth in the quantity of wine exported (from 0.7 million in 1995 to 4.5 million hl in 2017, increased in 2018: +18%) and imported (mainly from France, Italy and Portugal).



- Quantity of wine exported in Chile, Italy and South Africa (1,000 hl, 1995-2017) (OIV database 1995-2017).

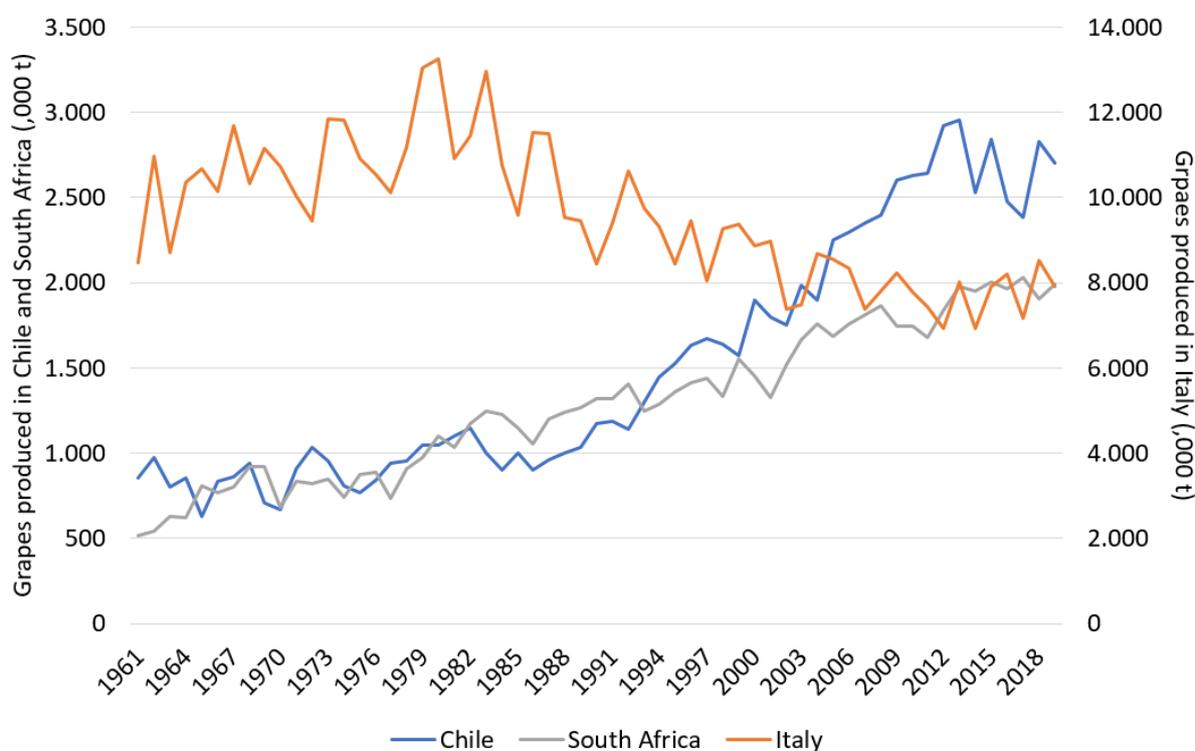


■ SCIENTIFIC DATA AND FIRST RESULTS

Socioeconomic impact of grapevine yellows

Grapevine yellows can be considered the most important disease of *Vitis vinifera*, detected in several viticultural areas of the world. This disease, which involves several '*Candidatus Phytoplasma*' species, is characterized by similar symptoms, but different associated agents and epidemiological cycles. The phytoplasma associated with "flavescence dorée" occurs in all the major wine-producing areas of the Mediterranean countries and the phytoplasma is a quarantine organism. Severe crop losses have been attributed also to the phytoplasma associated with the "bois noir" disease. Outbreak of phytoplasma epidemics could be a risk in the vineyard agroecosystems, leading to negative economic impacts, more or less serious, depending on the severity of the infections since the life time of the diseased vineyards is reduced, and the quality of wine could be compromised by high acid and low sugar contents of fruiting clusters.

A vineyard is no longer economically viable when its productive plants are less than 25% of the total (CABI, 2013). This can happen when grapevine yellows are present. In Italy, the most damaging grapevine phytoplasma epidemics exploded in all the Northern area, starting from the beginning of the '80s. In Chile, the rapid expansion of the acreage and production resulted in a variable spreading of the diseases, that is associated with several phytoplasmas. No serious outbreaks have been reported in literature and the drop of Chilean production in the last years seems to be due to bad weather conditions or diversification of productions. The climate change is considered one of the most important concern for the development of grapevine sector also in South Africa (Vink *et al.*, 2010) where the epidemic outbreak of phytoplasmas in grapevine is associated only with the presence of '*Candidatus Phytoplasma asteris*'.



- Production of grapevine in Chile, South Africa and Italy (tons) (FAO DB 1961-2019).

**KEY WORDS**

Grapevine, wine, vineyards, phytoplasmas, diseases

FURTHER INFORMATION

Belli G., Bianco P.A., Conti M. 2010. Grapevine yellows in Italy: past, present and future. *Journal of Plant Pathology* 92(2), 303-326.

Dermastia M., Bertaccini A., Constable F., Mehle N. 2017. Grapevine yellows diseases and their phytoplasma agents - Biology and detection. Springer Briefs in Agriculture, Springer International Publishing AG, Switzerland, 99 pp.

FAOSTAT - <http://www.fao.org/faostat/en/#data>

OIV database - <http://www.oiv.int/it/statistiques/recherche>

OIV (2020), State of the world vitivinicultural sector in 2019

Vink N., Deloir A., Bonnardot V., Ewert J. 2010. Climate change and the future of South Africa's wine industry. *International Journal of Climate Change Strategie and Management* 4(4), 420-441.

AUTHORSHIP

Giovanna Sacchi CREA – Policy and Bioeconomics, Legnaro (Padova) Italy giovanna.sacchi@crea.gov.it

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