

13. Tokaj

Tokaj is one of the world's most historic and celebrated wine regions (Tokaj is the place, Tokaji the wine). The famous *Aszú* (sweet wines made from shrivelled and botrytis-affected grapes) were first mentioned in 1571. In the 18th century, Tokaj created one of the first controlled appellations, classifying its vineyards and decreeing which villages were allowed to use the Tokaj name.

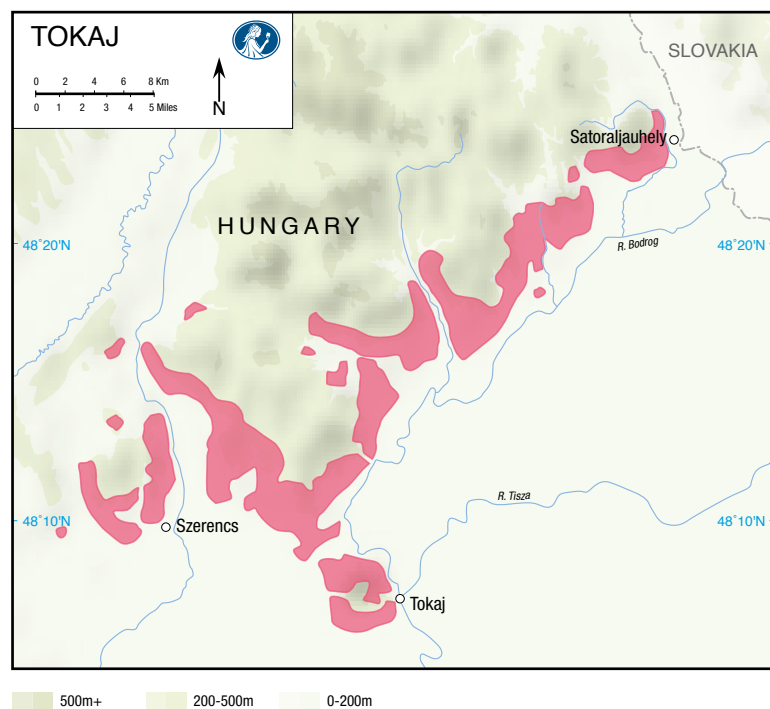
For centuries, Tokaji was one of the world's most famous wines, enjoyed in royal courts across Europe (it offered sweetness before crystal sugar became available). Unfortunately, this tradition was brought to a halt when Hungary became a Communist state in 1945 and the focus shifted from quality to quantity: wines were often deliberately oxidised, sweetened, fortified and pasteurized.

However, during the Communist regime, more vineyards remained in private hands in Hungary than in other Eastern European countries meaning that, when Communism ended in 1989, producers in Tokaj were able to start rebuilding their reputation more quickly.¹ Helped by the arrival in the early 1990s of foreign investors such as AXA, Vega Sicilia and Hugh Johnson, winemaking has evolved considerably in the last 25 years with a return to a fresher and fruitier style of *Aszú* and the development of a new generation of high-quality dry wines and new styles, such as Late Harvest.

13.1. The Growing Environment and Grape Growing CLIMATE

The Tokaj region lies in the north-eastern corner of Hungary. It extends from the town of Tokaj into the foothills of the Zemplén Mountains towards the Slovakian border (a small part of the region continues into Slovakia).

Tokaj has a moderate, continental climate: summers are warm whilst winters can be cold, although the region is sheltered from the worst of the cold, northerly winds by forested mountain peaks. The vineyards are mainly planted on slopes which helps reduce the risk of winter cold and frost damage. Importantly at this latitude (48°–49°N), the slopes face south, south-west and south-east to take maximum advantage of the sunlight (sunshine hours are between 1,400 and 1,500 hours in the growing season).





A misty morning in Tokaj

Rainfall ranges from around 500 to 600 mm per year. Although this is relatively low, around half of this falls during the growing season. Irrigation is not permitted.

Autumns are warm and dry, providing ideal conditions for the shrivelling of the grapes. Two major rivers (the Tisza and Bodrog) meet in the town of Tokaj; the Bodrog floods regularly creating shallow marshes and water meadows. The moist air results in frequent morning fogs in the autumn, ideal for the development of botrytis. In the autumn, the warm, sunny afternoons control the development of botrytis and limit grey rot.

SOIL

Tokaj is a region of hundreds of extinct volcanoes. The deep volcanic bedrock is overlaid by a complex variety of soils, the most significant of which are *nyirok*, a volcanic soil which is said to produce the most powerful wines, and loess, a sandy silt with high clay content found particularly around the Tokaj hill (to the west of the town) which is thought to produce lighter, more delicate wines.

The soft volcanic bedrock means vines can root very deeply, making water stress and nutrient deficiencies rare. It is also ideal for digging the cellars which are widely used in the region for ageing wine. These cellars are famous for the grey-black cushiony growths of the cellar fungus *Zasmidium* (previously *Cladosporium*) *cellare*, which is believed to help regulate humidity.

VINEYARD MANAGEMENT

Traditionally vines were grown on single posts at a density of up to 10,000 vines per hectare. This is still occasionally seen in small old plots but almost all vines are now grown on trellis, using replacement-cane pruning or cordon training with VSP and at lower densities (on average between 4,000 and 5,000 vines per hectare).

The modern training systems have allowed mechanisation. However, many vineyards are still worked by hand, especially on steeper slopes and, in any event, hand harvesting is required for the careful selection of *Aszú* berries. Labour availability is not currently a problem but may be in the future.

The main disease concerns are powdery mildew and, in wetter years, grey rot. Managing the canopy to ensure good air circulation is particularly important for grapes intended for dry wine. Pests include wild boar and birds.

Because *Aszú* berries have shrivelled on the vine, yields are tiny (2 to 3 hL/ha). To ensure quality, yields for dry wines are also kept relatively low (on average around 30 to 40 hL/ha). It is possible to have higher yields in warm, sunny vintages, but in poor years yields must be controlled to ensure ripeness.

GRAPE VARIETIES

There are six permitted grapes varieties in Tokaji PDO, the most important being Furmint, Hárslevelű and Sárga Muskotály (Muscat Blanc à Petits Grains).

Furmint

Furmint is by far the most planted grape in Tokaj with 63 per cent of all plantings.¹ It is a very versatile grape capable of producing high- quality wines from dry to sweet. It is late-ripening and needs Tokaj's long, sunny growing season to ripen fully. However, even when fully ripe, it retains high levels of acidity.

Furmint is well-suited to the production of sweet wines. Despite being thick-skinned, Furmint is particularly susceptible to botrytis, making it a vital component in *Aszú* wines. As they ripen, the grapes naturally accumulate high levels of sugar which are further concentrated by the action of botrytis, shrivelling and late harvesting; however, this is balanced by high acidity in even the sweetest wines.

Dry wines are produced in a range of styles, from those which are intended to be drunk young to more ageworthy examples; the latter often being matured in oak. Due to the high sugar levels, they can be full-bodied with high levels of alcohol. However, due to improved viticultural practices it is now possible to get wines that are ripe and at medium alcohol levels. Single-varietal dry wines are increasingly common.

Typical flavours include lemon, apple and pear which can be detected in all styles of wine. The wines develop notes of honey and nuts with age. Grapes affected by botrytis give flavours of dried apricot and mango.

Hárslevelű

Hárslevelű is the second most planted grape (19 per cent of the total). It produces wines which are fruitier than Furmint with distinctive aromas of white peach and orange blossom. Hárslevelű appears mainly in a supporting role in blends, adding its distinctive perfume, although it is sometimes made as a varietal wine, both dry and sweet.

Sárga Muskotály

Sárga Muskotály (Muscat Blanc à Petits Grains) accounts for 12 per cent of the region's vines. It adds floral notes in blends in both sweet and dry wines, but also appears as a varietal wine, mainly dry but occasionally sweet.

13.2. Winemaking and Wine Styles**ASZÚ**

Aszú is the Hungarian word for grapes that have been infected with botrytis and have shrivelled on the vine. The sugary juice inside these shrivelled grapes is so concentrated that it cannot be effectively extracted by normal pressing. The *Aszú* grapes are therefore macerated in must, fermenting must or base wine to draw out their sugars and flavours. Classic *Aszú* is deep amber in colour, high in acidity with low to medium alcohol and intense aromas of orange peel, apricots and honey. The best can reach super-premium prices.

In the autumn, the foggy mornings allow botrytis to develop and the breezy sunny afternoons shrivel the grapes. Warm, humid autumns encourage the development of botrytis; in hotter, drier years, yields of *Aszú* wines will be significantly reduced.

Aszú grapes are picked individually in several passes through the vineyard, a time-consuming and labour-intensive process. They are then stored until required.

Prior to maceration, most producers mash the *Aszú* grapes into a paste. They do this by crushing or breaking open the grape in some way, usually by passing them through a pump. A number of producers, however, prefer to use uncrushed grapes to avoid any bitterness from the skins and seeds.

The paste or grapes are macerated usually for between 12 and 60 hours. Where uncrushed grapes are used, these will be punched down regularly. Maceration usually takes



The beginning stages of botrytis.



Heavily botrytised grape bunch.

place at around 12–15°C (54–59°F) but may rise to 16–20°C (61–68°F) with strongly fermenting must.

The choice of maceration method depends on the desired style of wine: maceration in must gives the lightest styles followed by maceration in young finished wine. Maceration in fermenting must gives the strongest extraction and most complex wines, but unless berries are both ripe and clean, can also extract unpleasant bitter, unripe characteristics. The timing of the maceration also affects the final style of wine: strongest extraction occurs when the must is fermenting most actively early on while some producers prefer the later stages for a lighter extraction.

Where base wine is used for maceration, it must by law have a minimum potential alcohol of 12% abv, though in practice the base wine is often 14.5–15.5% abv (which is lowered by the addition of the *Aszú* berries/paste). Otherwise, winemakers are free to choose which grape varieties they use (Furmint and Hárslevelű are the most common) and how botrytised the grapes that make this base wine are. Some producers prefer a rich and botrytised base wine to give extra complexity and creaminess. Others prefer minimal botrytis in the base wine to allow the character of the *Aszú* grapes to show through. The base wine for *Aszú* is different to the [dry styles](#) of wines produced, for which over-ripeness and botrytis are avoided.

When the maceration has taken place in must or fermenting must, the juice is drained and the *Aszú* paste or berries are pressed. The must is then fermented (or continues to ferment) to gain the desired balance of sugar and alcohol. Some producers use ambient yeast for fermentation, but many prefer cultured yeast for their reliability, as the high sugar levels can make fermentation difficult. Both stainless steel tanks and barrels are used for fermentation.

Depending on the desired style of wine, some target a higher level of alcohol (12 to 13.5% abv) to produce a less sweet style. Fermentation may stop naturally, especially at higher sugar levels (180 g/L and above) and these wines will be naturally stable. However, many producers stop fermentation (by chilling or racking the wine or adding SO₂) to avoid the risk of refermentation and to control house styles.

Aszú wines must be stored for a minimum of 18 months in oak, though some producers prefer longer. Hungarian oak, often from the Zemplén mountains above the region, is widely used for fermentation and ageing. Traditionally, wines were matured in small 136-litre barrels (known as *gönci*); however, most producers are now switching to larger barrels (300 to 500



Maturation in barrel in cellars carved from the volcanic bedrock

L). There is a mixture of new and older oak in use. *Aszú* wines must be bottled in a traditional, clear-glass, 500 mL Tokaji bottle.

Until 2013, *Aszú* was classified by its level of sweetness, using the *puttonyos* scale. Traditionally, this measure counted the number of pickers' buckets or hods (*puttony*) of *Aszú* berries added to a traditional *gönci* barrel of must. However, more recently it had been measured by set minimum residual sugar levels, with 'three *puttonyos*' having the least residual sugar and 'six *puttonyos*' denoting the most. In 2013, Tokaj regulations changed significantly: the minimum level of residual sugar was increased to 120g/L, the equivalent to the previous minimum for five *puttonyos*. Wines with lower levels of sugar are now labelled Late Harvest or Tokaji Édes Szamorodni depending on how they are made. *Aszú* wines can be labelled as 'five *puttonyos*' or 'six *puttonyos*' (above 150 g/L residual sugar), but this is not mandatory. (Wines can be labelled 'three *puttonyos*' or 'four *puttonyos*' if the producer wishes as long as they have a minimum of 120g/L of residual sugar.)

ESZENCIA

These are extremely rare, and therefore extremely expensive, wines made from the tiny volume of syrupy free-run juice that trickles from *Aszú* berries.

The juice is so sweet that it can take years to ferment and even then only reaches very low levels of alcohol (usually less than 5% abv). The legal minimum residual sugar level is 450 g/L, and the wines are full-bodied (often with the consistency of syrup) with pronounced, highly concentrated flavours. High in acidity, these wines can retain their freshness and therefore age for a very long time.

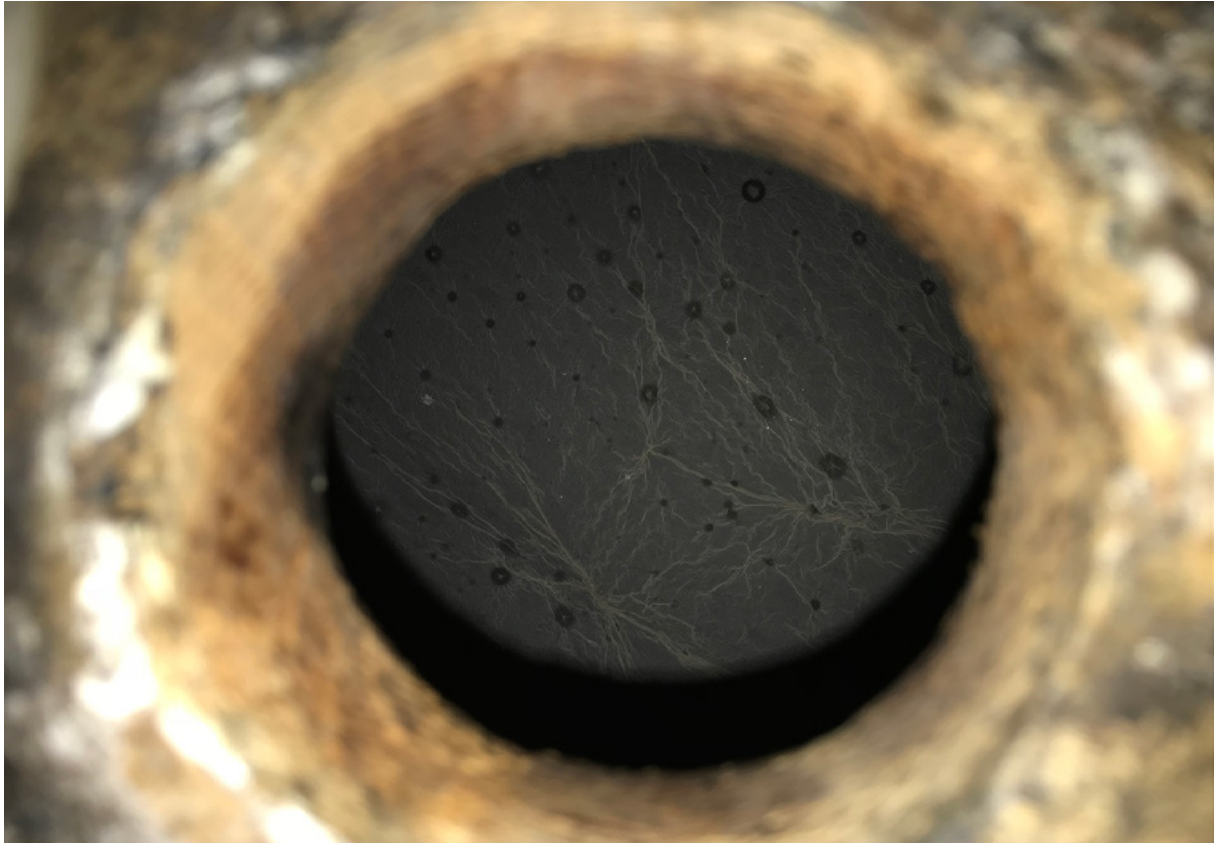
LATE HARVEST

Recently, as a reaction to the amount of time and investment needed to produce and mature *Aszú* wines, a new style of Tokaj has been emerging produced in a similar way to sweet wines found in other wine-producing regions (the maceration process is not used). Late Harvest wines are typically produced with a lower proportion of botrytized grapes than for *Aszú* wines. Late Harvest wines tend to be lighter bodied and less concentrated than *Aszú*. The legal minimum residual sugar level is only 45g/L although most wines are between 90 and 110g/L. Oak ageing is not compulsory and many wines spend little or no time in oak (and instead are stored in stainless steel) as producers aim to emphasise the fruit characteristics. The result is that Late Harvest wines are ready for release much earlier than *Aszú*, typically between 12 and 16 months after harvest.

SZAMORODNI

Szamorodni is a Polish word meaning 'as it comes', indicating that this traditional style is made from whole bunches with varying amounts of healthy and botrytized grapes. It is produced in either a sweet (*édes*) style or as a dry (*száraz*) wine, depending on the level of ripeness and botrytis.

The sweeter style is the more common. The minimum residual sugar level is 45g/L, although most are bottled at around 90 to 110g/L. Following a change in the law in 2016, the wines need only be aged in oak for 6 months, considerably shorter than for *Aszú*. As a result, a number of producers are placing greater focus on the category, seeing it as a more authentic Tokaji wine than the more recent Late Harvest style. Bottled in the same traditional,



Flor yeast on the top of dry Szamorodni in barrel

clear, 500 mL Tokaji bottle as *Aszú*, the best *édes* wines can be of equivalent quality to *Aszú*, though in a fresher style.

Dry *Szamorodni* is aged under a thin film of flor yeast (much thinner than those formed in Sherry production) for up to 10 years without topping up. The wine is protected from excessive oxidation and it develops nutty and green apple aromas.

DRY WINES

For much of Tokaj's history, dry wines were essentially a by-product, produced when botrytis did not develop. However, as in many regions whose reputation was built on sweet wines, there has been a significant move towards dry wines in the 21st century and some high quality examples are now being produced. Production has tripled in the last five years.

Producers have started to understand the different approach required to produce dry as opposed to sweet wines. For example, good dry wines need healthy grapes with no botrytis: producers are planting new vineyards on higher and windier sites above the fog zone and using more open canopies and appropriate vine treatments to prevent rot.

At first, the new breed of dry wines were made from very ripe grapes, underwent full malolactic conversion and lengthy periods of ageing in new oak barrels. However, since then, many producers have reined in their approach, using less ripe berries, fermenting in stainless steel and generally taking a less interventionist approach to produce lighter-bodied wines which better show varietal character. They are also increasingly looking to express *terroir* and a number of single-vineyard (*Dűlő*) wines are now produced.

Dry wines are most often made from Furmint but Hárslevelű and Muscat are also used and blends are also made. Under PDO, wines labelled as a single varietal must contain at least 85 per cent of the specified grape.

13.3. Wine Law and Regulations

Hungary joined the EU in 2004 and has adopted a PDO/PGI system of wine appellations.

Tokaji PDO is further broken down into more specific categories of village and estate wines and certain designated vineyards can be named on the label. From the 2013 vintage, PDO wines must be bottled in the region.

The various different styles of Tokaji PDO (e.g. *Aszú* and *Szamorodni*) are defined by law. Many of the various regulations regarding grape growing and production for these styles has been covered in the preceding sections.

There is a PGI (**Zempléni**) which is used for wines made from other grapes, in particular international varieties, and for inexpensive wines produced at yields higher than those permitted by the PDO.

13.4. Wine Business

In 2022, there were 5,260 hectares under vine in Tokaji PDO.² This figure has increased, compared with a decade ago, as new, higher vineyards were planted to produce high-quality dry wines. However, barely half of the potential vineyard area has been planted.

The average size of holdings is small, between 1 and 2 ha, and many growers have contracts with larger producers to provide grapes, especially *Aszú* berries.³ For example, the state-owned Grand Tokaj sources from over 2,000 growers and produces 30–35 per cent of region's wines.

Production over the five years from 2017–2021 has averaged at 150,000 hL.⁴ Although there is some vintage variation, based on harvest averages for the last five years, *Aszú* accounts for up to 10 per cent of production and dry wines 15 per cent.⁵ Of the rest, a significant amount is inexpensive, non-botrytised wine (often made semi-sweet by stopping fermentation early) destined for the home market and other Eastern European countries. Only relatively small amounts of Tokaji are exported outside Eastern Europe, with UK, USA and Canada being the largest markets. Overall, exports account for around 40 per cent of production.⁶

References

- 1 [Bortermelés Statisztika](#) Hegyközségek Nemzeti Tanácsa (retrieved 25 January 2023)
- 2 As above
- 3 Personal communication, Caroline Gilby MW, email, September 2018. Original source of data Tokaji Borvidék Hegyközségi Tanácsa.
- 4 [Volume of wine produced in the Tokaj wine region in Hungary from 2011 to 2021](#), Statista (retrieved 25 January 2023)
- 5 Personal communication, Péter Molnár, Tokaj Wine Council, email 24 February 2023
- 6 Personal communication, Caroline Gilby MW, email, September 2018. Original source of data Hungarian Central Statistical Office.