

Merlot

early budding (vulnerable: spring frost)

mid ripening - advantageous - picked early before early autumn rain

coulure, botrytis, drought -> sorting necessary to maintain quality

can ripen fully in cooler years of late ripener Cab Sauv -> dominant in whole Right Bank and in cooler northern Medoc where more fertile soils with a high clay content <- cooler soils with water holding capacity enables production of larger berry size typical of Merlot

reaches higher sugar levels -> higher potential alcohol levels than both Cabs (less advantage with climate change)

Cabernet Sauvignon

late budding (protected from spring frost)

small berried thick-skinned variety with high tannin content

fungal disease esp powdery mildew

trunk diseases Eutypa and Esca

late ripening -> need warmer soils, vulnerable to early autumn rains

produces best quality fruit on warm, well-drained soils eg gravel beds of Medoc

in cool vintages, growers struggle to ripen it fully -> high acid, unripe tannins, little fruit
-> regularly blended with earlier ripeners Merlot and Franc

Malbec

after the hard frost of 1956, mainly replaced with Merlot as its easier to grow in Bordeaux
Petit Verdot

early budding (spring frost), later ripening than Cabernet Sauv (failure to ripen in cool years or rain at harvest) -> unpopular with growers in the past

does best in warmer parts of Medoc

oft < 5% of the blend if used

deep color, spice, high tannins

increasingly valued despite few plantings, more likely to ripen with climate change

Semillon

mid ripening

Botrytis bunch rot and noble rot

high yielding

light intensity apple lemon, grass if underripe

Medium acid/body/intensity across the board

softens Sauv Blanc's more intense flavor and high acidity

strong affinity with vanilla and sweet spice flavours from new French oak (eg Pessac-Leognan most overtly oaky)

in botrytis affected dessert wines: pronounced honey, dried lemon/peach, waxy texture

its more prone to botrytis than Sauv Blanc: top Sauternes wines tend to have a high % in the blend eg Ch. Climens or Ch. d'Yquem

Longevity -> toast, honey with age cf Sauv Blanc capable of holding but flavors do not evolve

Sauvignon Blanc:

increasing amounts of dominantly/single-variety dry Sauv Blanc whites are being made due to its popularity

Muscadelle:

very prone to botrytis bunch rot: needs to be planted on well-exposed sites Majority used in sweet whites -> flowery and grapey notes

unrelated to Muscat

PN for red, Chard for white

Historically there was a substantial proportion of Aligoté and Gamay grown here until the early part of the twentieth century

Some well-regarded Aligoté is grown in the village of Bouzeron in the Côte Chalonnaise

Chardonnay

versatile variety suited to a range of climates

buds early (spring frost)

ripens early - suitable to grow in a cool region

can produce relatively high yields without loss of quality

prone to grey rot, powdery mildew, millerandage and grapevine yellows

can grow in a wide range of soils and climates -> a range of styles

many top-quality examples are grown on limestone/clay soils, as in Burgundy

in good growing seasons in Burgundy, main challenge in making high quality wine can be vigor management to avoid excessive yield and shading -> reduce fruit quality

Pinot Noir

early budding

early ripening - suitable for cool regions

unlike Chard, yields must be controlled to produce quality wines

delicate, prone to millerandage, downy, powdery mildew, botrytis, fan leaf, leaf roll viruses in warm climates, it tends to ripen too fast [reducing intensity] and berries can shrivel and suffer from sunburn

in Burgundy, typical concerns: whether the fruit will ripen sufficiently to achieve the desired ripeness (tannins, colour, flavour)

many clones for red/white Burgundy are from Dijon clone families developed at University of Burgundy in Dijon -> widely used in many wine regions around the world

clones differ in yield, disease tolerance, speed of ripening, fruit characteristics
producers must decide whether to plant vineyard plots with a single clone (-> a more uniform fruit profile) or plant a mix (-> greater diversity in grape characteristics -> more resistance to disease)

many propagate vines via mass selection

Main varieties grown: Riesling, Pinot Blanc/Auxerrois, Gewurztraminer, Pinot Gris
Noble: Riesling, Gewurztraminer, Pinot Gris, Muscat, permitted for Grand Cru wines and regulated styles Vendage tardive, Selection de grains nobles

Riesling

cold-hardy, late-budding -> protect against spring frost

needs a good site - full exposure to the sun and good drainage - and a long growing season to ripen fully, but once given, can produce high quality fruit at a high yield ~ 70 hL/ha

resistant to downy mildew, fairly resistant to powdery mildew and botrytis bunch rot

Gewurztraminer

early budding - prone to spring frost

early ripening - avoid autumn rain

rapidly accumulates sugars, but still picked late to achieve fully ripe grape skins to max aromas and avoid unripe tannins

vigorous - needs pruning and canopy management

moderately productive due to coulure

suffer from chlorosis and from desiccation of the stems

prone to powdery mildew, grape vine, grey rot in Alsace <- virus-free clones developed here

"Gewurz" spice

Pinot Blanc and Auxerrois

Auxerrois - late ripening, low aromatic, low acidity, freq used in blends or Cremant d'Alsace

Pinot Gris

early budding - spring frost

early ripening - avoid autumn rains

moderate yield

susceptible to botrytis bunch rot, downy mildew

can accumulate high sugar levels -> high abv

best examples can have a rich oily texture, age worthy -> honey, smoky

can see a very rapid increase in sugar levels and a drop in acidity -> picking dates for

Pinot Gris become an important topic in Alsace with earlier picking enabled by climate and canopy management

shift towards drier styles -> more wines dry with 12.5–13.5% abv, rather than off-dry 13.5% abv

Pinot Noir

the only black grape allowed for Alsace AOC wines

Historically thin and lean wines but a warming climate, learning from other regions (Burgundy, neighbouring Germany) and local demand have resulted in rising quality with both unoaked and oaked wines

Domaine Muré and Domaine Albert Mann

Sylvaner

decline in Alsace bc PG/PB easier to grow -> majority of Sylvaner wines come from older vines - >=40 years - and little on valley floor -> gaining reputation as a source of good value wines of very good quality

Muscat

Muscat Blanc a Petit Grains and Muscat Ottonel grown here in tiny amounts Ottonel ripens earlier than BPG, avoiding autumn rains

Syrah

Vigorous: careful training and tying in to protect it from Mistral

on steep slopes of top appellations: plants oft tied to one or two poles as trellising not possible, cost+++

prone to mites, botrytis bunch rot

disease: Syrah decline or disorder where the leaves turn red and the graft point breaks up and vine dies

the only red variety used in northern Rhone crus

Grenache Noir

high yielding, needs warmth to ripen

late ripening affected by early autumn rain

upright growth suitable for bush vine pruned short to contain vigor

does well on dry infertile soils

drought resistant, prone to coulure -> reduce yield

prone to fungal diseases eg downy mildew, phomopsis, botrytis

prone to bacterial necrosis or bacterial blight, killing leaves and shoots and plants eventually

combated by planting only disease free stock and avoiding contamination from pruning tools

accumulates high sugar levels quickly

can be an issue in dry wines

suitable for VdN

major component in southern Rhone blends

Mouvedre

late budding, late ripening

only thrives in warm to hot climates

needs high temp end of season to ripen fully otherwise underripe

not drought resistant but requires small but regular amounts of water from deep calcareous soils that stores water

best pruned short

Cordon or bush vines

only produces low yields

prone to mites, leafhoppers, sour rot [affects ripening bunches bc insect or bird damage to grapes which then become prone to bacteria and fungi]

strongly prone to reduction in winery: adequate access to oxygen

typically aged in old oak: cost+++

Almost always used as parts of a blend in Rhone

Cinsault

Late budding, high yielding

good drought heat resistance

yield must be restricted for quality

if grown on soils with excessive limit it can suffer from chlorosis

prone to esca and eutypa, mites, grape moths

in southern Rhone typically used as a small part of the red blend

typically made in a way that preserves fruit flavors - mid-range temp, aged briefly in SS
-> m/m+ intensity of red fruit, high alcohol, low/med tannins, suitable for early drinking
reds/roses

Viognier

early budding: spring frost prone

normally on a trellis or on poles to prevent wind damage

low yields unpredictable bc poor flowering and fruit set aka coulure: reduce returns

picking must be judged carefully to allow it ripen fully with typical pronounced aromas but if left too long it loses flavor and acid and gain sugar fast -> unbalanced wines lacking flavor

med lemon in color, pronounced aromas and flavors of honeysuckle, apricot, peach, med/high alcohol, low acid

~20% allowed in Rhone reds made with Syrah

Marsanne

late budding - helps avoiding spring frosts

Vigorous

must be kept low to reduce amount of fruit being ripened to produce high quality wine

best on stony and low fertility soils (keeping the yield low) thus does well on slopes of northern Rhone valley

prone to powdery mildew, mites, botrytis

med lemon in color, sometimes gold, light intensity of honeysuckle, lemon, apricot, oily texture, med acid, full body, med/high alcohol

northern Rhone: varietal or blended with Roussanne; southern Rhone: part of a blend

Roussanne

late budding

best on low fertility well drained soils

poor wind resistance: sites must be chosen carefully

Yields variable bc coulure

prone to powdery mildew, botrytis, mites: lower yield, additional work in vineyard -> cost++ pear with herbal notes, med/med (+) acidity and med to high alcohol

more difficult to grow than Marsanne and less commonly grown in Rhone

Clairette

Vigorous

rows well in low fertility dry soils suited to southern Rhone and its low rainfall pruned short, and excessive buds removed, grows upright, to contain vigor

wind resistant without staking

ripens late, prone to early autumn rains

oxidises easily, needs careful handling in the winery

goes into white blends in southern Rhone: freshness, fruit, white flowers, fennel, apple, grapefruit, high alcohol, low/med- acid

Grenache Blanc

early budding: occasionally spring frost prone as mainly grown in mild south of France and in Spain

good wind resistance

other grape growing issues - > Grenache Noir

in Rhone almost exclusively in southern for dry white blends and VdN <- its tendency to reach high potential alcohol levels is a benefit

low intensity ripe green fruit and floral notes, high alcohol, low acidity

Bourboulenc

late ripening

loose bunches

thick skins: resistance to botrytis bunch rot, necessary for late ripener grows well in warm dry locations suited to southern Rhone

typically in white southern Rhone blends: lemon, m+ acid, m alcohol

Carignan - Carignane

buds late - avoid spring frost

ripens late - needs a warm climate with a long ripening season

high yielding $\geq 200\text{hl/ha}$ -> popular in the past when high vol sought after -> low flavor concentration

sharply reduce yields for high concentration (natural for old vines >50 years)

prone to powdery mildew as bunches firmly attached to vine

EU vine pull scheme sig reduced planting

by far largest planting in Languedoc, being replaced with other

high acid, high tannin, oft seek to soften by carbonic maceration or by blending with other varieties

typically unoaked med ruby simple black fruit except old vines

Tannat

vigorous -> best on a trellis

mid ripening -> picked before the onset of autumn rains prone to botrytis

wines intended for ageing

deep ruby in colour

pronounced aromas and flavours of blackberry and blackcurrant plus oak flavours high tannins, high acidity with a full body and M++/high alcohol

Earlier drinking styles with lower levels of tannins and concentration are also made

Petit Manseng

early budding -> spring frost

mid to late ripening

thick skin, resistant to botrytis, suitable for late harvesting highly aromatic

retains high acidity -> suitable for sweet wine

Gros Manseng

characteristics of Petit Manseng but has higher yields for dry wines

Chard: 40% of planting, most planted, much goes into Cremant du Jura. Early budding -> spring frost

Savagnin

: 20% of all planting, white, both conventional white and oxidative Vin Jaune. Early budding -> spring frost; thick-skinned variety resistant to fungal diseases; thrives on steep slopes with marl; high acidity, medium (-) lemon apple, medium body/alcohol

Poulsard (Ploussard)

most planted black grape ~15% plantings; very early budding -> spring frost, prone to coulure -> yield reduction; thin-skinned -> fungal diseases; early ripening; pale ruby, translucent in color, light intensity, redcurrent, cranberry, low tannins, high acidity, low alcohol, light body

Pinot Noir: second most planted variety used in multi-variety red blends in Cremant du Jura and increasingly as a single variety red

Trousseau

thick skin, resistant to fungal diseases, prone to botrytis, poor flowering, coulure -> reduce yield; vigorous -> canopy management; needs a warm site to ripen fully (eg warm gravels, on warm lower part of the slope or on well exposed higher steeper

slopes); pale ruby, light intensity, red cherry, low/medium tannins, medium/high acidity, low/medium alcohol, light/medium(-) body

German Crosses

Muller-Thurgau

- 1880s, ripens earlier than Riesling

new crossings increased rapidly mid 20th century: high yield, high must weights, high sugar without enough acid/aromatics -> Liebfraumilch

as techniques develop to allow ripening esp Riesling, interests in crosses fell even quality ones

Scheurebe

: full body, intense ripe grapefruit, peach, lower acidity than Riesling but enough to make ageworthy wines, and high sweet wines

Kerner

: quality wines up to high Pradikat levels with high acidity, some fruit, floral characteristics of Riesling

Dornfelder

now second most planted black variety

Riesling

23% planting

late budding, thick wood?, frost resistant

Late ripening -> needs good sun exposure and dry autumns; may not fully ripen in cool years/sites -> planting fell in 1970s/1980s as producers turn to more reliable German crosses achieving must weights required by law readily

improved vineyard management techniques and rising temperature -> greater consistency of ripening, recovery/growth of plantings

produces high quality wines in all styles

retains high acid when fully ripe -> balance in sweet wines and aging potential

given right conditions -> high natural levels of sugar and susceptible to botrytis <- ideal for sweet wines

Muller Thurgau aka Rivaner

one of earliest German crosses

earlier ripening than Riesling

High yielding in almost any conditions

Germany's most planted grape variety in 1970s/1980s - widely used in cheap blends eg Liebfraumilch -> planting halved as popularity fell

medium acidity, less structure/character, attractive but relatively simple floral fruity for early drinking

Spatburgunder

most planted black 11.5% total planting

rapid rise in popularity domestically and export -> planting trebled and thrives in warm areas eg Baden

Germany increasingly recognized as complex dry PN often WITH OAK AGING <- improved vineyard management, high quality clones, better canopy management, better selection of harvest dates to balance alcohol, acidity, ripeness of fruit/tannins

some use whole bunch fermentation where tannins contributed by stems -> no need to use oak for tannins

general trend: less new oak, more larger oak than 10-20 years ago

Dornfelder

most significant of the black German crosses: nothing to the second most planted black in past 30 years

deep in color, high acid, fruity, floral

two styles:

fruity easy drinking, sometimes with RS, aromas of sour cherry, blackberry, Complex with aging potential from lower yields - greater focus on tannins/structure, oak fermented or aged

hit in Rheinhessen and Pfalz where its the most planted black variety ahead of PN

Silvaner

aka Sylvaner in Alsace

planting halved since 1980, decline stabilised

lower acid/aromatic than Riesling

simple cheap wines with subtle fruit: green to tropical

when controlled yields, esp in Franken, high quality dry medium-bodied wines w/ M/M+ acid and earthy character

overtaken by Grauburgunder and Weissburgunder (PG, PB) which grew in popularity since 1990s >>

Grauburgunder and Weissburgunder (PG, PB)

both high quality wines some oak aged

Grauburgunder: esp likes heavier soils; M acid, stone/tropical fruit (sometimes dried), honey, dry to sweet (labelled as Rulander)

Weissburgunder: well balanced, M+ acid, citrus, stone fruits

Chardonnay

allowed in Germany since 1990

planting remain very low

high quality examples are produced oft with OAK aging in warmer areas eg southern Pfalz and Kaiserstuhl in Baden

Portugieser, Schwarzriesling (Pinot Meunier), Trollinger (Schiava), Lemberger (Blaufrankisch): mainly simple fruity wines for drinking young esp in Wurttemberg, some high quality examples from lower-yielding sites esp from Lemberger

Gruener Veltliner

widely planted: 31% all plantings Austria

does not thrive in dry soils

Better suited to clay and loess which retain higher levels of water

vigorous if on fertile soils so careful canopy management necessary to produce ripe grapes thick skins if left in contact too long: phenolic bitterness

Skins also contain chemical compounds that give a peppery aroma characteristic of this variety

Welschriesling

unrelated to Riesling

the second most planted white grape in Austria high acid, neutral aromatics

mainly in Steiermark usu made into fresh neutral unoaked dry wines of ok to good quality planting in decline bc decrease in consumption of simple dry style

large planting in Burgenland around humid Neusiedlersee

thin skin: affected by noble rot, for sweet wines BA or TBA

high acid, pronounced tropical fruit, dried fruit, ability to age in bottle very good to outstanding premium price

neutral aroma and high acid: Sekt production

Riesling

~4% of all plantings in Austria

one of the most prized varieties

mostly in Niederösterreich, second most planted white grape variety

warmest sites on thin soils as it needs less water than Gruner

dry, can be full body, high acid, med alcohol, ripe stone fruit, sometimes tropical fruit, improve over 10-20 years into nutty, honeyed, petrol; very good/outstanding premium

Zweigelt

most planted black ~14% all planting

Sankt Laurent X Blaufränkisch

earlier ripening than Blaufränkisch

high yielding, vigorous, so leaf removal and canopy management important to produce quality fruit

potassium deficiency can lead to grape withering before they ripen -> loss of crop for that vintage

widely planted throughout country bc ease of ripening

NOT prone to frost/rot

med+ acid, med tannin, red esp cherry

Blaufrankisch

med+/high tannins, high acid, deep color, black fruit

early budding: spring frost

late ripening: needs warmth to fully ripen thus generally only in Burgenland thick skin:
NOT prone to rot, important in humid Neusiedlersee

can produce high yields if so struggles to ripen: green aroma/flavor

yields can be managed to produce age worthy intense reds

simple or premium styles in Leithaberg DAC, Mittelburgenland DAC

Sankt Laurent

local black, deep ruby, red cherry, med tannin

Furmint

69% all plantings, susceptible to botrytis -> Aszu

single-varietal dry wines are increasingly common

lemon, apple, pear in all styles; honey and nuts with age; dried apricot and mango when affected by botrytis

Harslevelu

18% of all planting

much fruitier than Furmint: white peach, orange blossom, mostly supporting the blends with distinctive perfume

sometimes made as a varietal wine, dry/sweet

Sarga Muskotaly (Muscat Blanc a Petits Grains) 9% of planting

adds floral notes in both sweet and dry wines

also as a varietal wine, mainly dry occasionally sweet

Whites: >70% production

most planted:

Savatiano

- workhorse grape of central Greece, due to drought resistance, for large volumes of cheap wine, most common ingredient in Retsina; reputation rising with good quality examples from low-yielding, dry-farmed bush vines -> subtle aromas of citrus, pear, stone fruit, and nutty character with age

Roditis

second most planted grape variety, widely grown throughout Greece, ~ Moschofilero, pink-skinned, ability to produce high yields -> workhorse grape for cheap wine; reputation improving due to higher-quality wines made at altitude and from old vines in Peloponnese - best examples: medium bodies with high acidity and ripe fruit like melon

Assyrtiko

best known most prized planting 1/5 of Savatiano/Roditis; originates from Santorini, widely planted on the mainland as highly adaptable to different conditions; retains high levels of acidity when ripe, even in hottest regions -> ages well, ideal for lusciously sweet wines ie Vinsanto from Santorini; dry wine -> citrus, stone, tropical fruit with strong smoky/flinty notes, some at least part of the blends aged in oak -> fuller body, less intense primary, more secondary

Moschofilero

quality potential. Aromatics of citrus, flowers (rose), spices, ~Muscat, high in acid, light bodied, low in alcohol ~12%. Pink-skinned -> pink tinge. Some roses are made with extended skin contact. Mainly planted in Mantinia in Peloponnese

Malagousia

almost extinct 20 years ago - medium acidity, medium body with complex and intense aromas of stone fruit and flowers. Grapes grown in cooler sites or picked early can have herbal or herbaceous notes. Maybe fermented in stainless steel, old oak, or with a proportion of new oak. Grown in most areas of Greece.

Muscat

significant plantings of various Muscat varieties usu used for everything from dry to lusciously sweet

Reds

Agiorgitiko

most planted black and 3rd most planted of either color. Versatile: a wide range of wines from a lighter fruity style for early drinking to more complex full-bodied age worthy style, high quality roses, sweet wines; deeply colored with medium acidity, medium-high soft tannins, medium alcohol, typical of ripe red fruits - can be jammy if allowed to get extra ripe - and sweet spices. Oft aged in oak, usu a proportion is new. Mostly in Peloponnese, highly regarded from PDO Nemea

Xinomavro

most prized, grown all over northern Greece but most famous from Naoussa in northern Macedonia. ~ Nebbiolo: high acidity, grippy tannins with more vegetal than fruity aromas in youth; pale-colored, turn garnet rapidly. Oft benefit from long bottle aging - the best wines from lower-yielding vines and aged in oak can age for decades -> complex aromas of flowers, herbs, spices, leather, and earthiness. More recently, a number of producers have started producing wines more accessible in youth - fruitier softer tannins using riper grapes and less extraction -> much fruitier with lower acidity, oft aged in new oak. Some blend Xinomavro with Merlot to soften rough edges

Trentino-Alto Adige

Local: vigorous, mid-late ripening, deeply colored, medium tannin wines - Teroldego (black cherry), Marzemino (red cherry) and Lagrein (ripe berry fruit) all closely related

Teroldego

the most common black in Trentino

historically on pergolas for high yields; Guyot for quality-minded producers suffer from drying out of stems

less susceptible to mildews than Marzemino and Lagrein

best clones 145 and 152 for intense aromas

best from Teroldego Rotaliano DOC on sandy and gravelly soils in the far north of Trentino, outside it, Teroldego cannot be bottled as Trentino DOC but as Vini delle Dolomiti IGT

Marzemino

prone to botrytis bunch rot and powdery mildew

older vines usu on pergolas

newer lower-yielding clones on spurred cordons

best ripest from Ziresi subzone of the Trentino DOC due to full sun exposure and rich calcareous/clay and basalt soils

Lagrein

needs a warm site with plenty of sunshine to ripen fully

subject to poor fruit set -> low yields

bitterness & harsh finish addressed by shorted maceration times and oak aging

deep color -> also for roses

labelled in either Italian or German as 'red' and 'rosé': Lagrein rubino/dunkel and Lagrein rosato/kretzer

Moscato Rosa

Muscat family, rose-scented sweet wines

subject to poor fruit set, botrytis bunch rot -> difficult to grow appassimento method or by picking late harvest fruit premium priced

Nosiola

white, grown in the valley of the Lakes - the warmest area with a sub-continental climate
small volume, hazelnut flavor from the fruit, not from oak

subject to spring frosts, powdery mildew, sour rot

dry wine mid-priced, Vino Santo premium priced

Local varieties:

Whites:

Ribolla Gialla, Malvasia di Istria, Verduzzo and Picolit

Reds: Refosco, Schiopettino, Pignolo, Tazzalenghe

Varieties in common with Austria/Middle Europe: Riesling, Welschriesling (Riesling Italico in Italy), Gewurztraminer, Muller-Thurgau, Blaufrankisch (Franconia)

French varieties: Merlot, **Sauvignonasse (ie Friulano)**, Chard, Sauv Blanc, Cab Franc, Pinot Blanc, Cab Sauv, PN, Carmenere

Friulano:

formerly Tocai Friulano, renamed Friulano ('from Friuli') when EU ruled that the name Tokaj was only to be used for the wine style in Hungary; known elsewhere as Sauvignon Vert or Sauvignonasse, prominent in Friuli;

disease resistant - important in a region with high rainfall;

medium (-) floral and apple flavors, medium to high alcohol, medium (+) acidity; either in stainless steel to preserve aromatics (most common) or lightly oaked.

Best wines age worthy; good to very good in quality mid-priced to premium

Ribolla Gialla

Only in Collio and Colli Orientali as it needs hillside sites to prevent it growing too vigorously

prone to shot berries

citrus and pepper notes, high acidity

many styles - oak-aged, no oak, Charmat sparkling wine, dry, off-dry, extended skin contact, orange wines, amphora wines

Refosco

Refosco dal Peduncolo Rosso - the most planted of the local red varieties

vigorous, best on hillside sites with low fertility

late ripening and resistant to botrytis, small berries -> high tannins

red wines produced - red cherry with herbal aromas, high tannins best smoothed out by time in barrels

Garganega:

vigorous, productive, late ripening,

traditionally trained on pergola, now may be trellised,

sensitive to winter cold, mildew, and botrytis,

usu handpicked on hillside sites and machine-harvested on the plain;

typically high acidity levels medium body & intensity of lemon, apple/pear, white pepper, and stone fruit in the ripest examples; typically no oak tho some high end are oaked; best can age -> honey, almonds, etc.

when well grown on favourable sites can produce fully flavoured wines at relatively high yields

Corvina Veronese aka Corvina

Vigorous dependable high yielding

thick skins suitable for drying -> Appassimento

prone to downy mildew, botrytis, esca, drought/sunburn

Mid/late ripening

well suited to pergola as it does not fruit on the first few buds of the cane and the shade prevents sunburn; height of pergola helps air circulation reducing disease and temperature but also more water evaporation

if carefully grown, can be on trellises

mostly blended in Valpolicella and related wines <- violet, red cherry, red plum, herbal, low/medium tannins, high acidity

a few single variety Corvina - Allegrini's La Poja - concentrated barrel-aged red

Corvinone - 'big Corvina'

from big clusters, NOT related to Corvina

prone to downy mildew

major problem: uneven ripening -> pick bunch by bunch complements Corvina as it adds tannins, red cherry, and dries well

Rondinella

reliable and productive

can grow on a range of soils

good disease resistance -> good for drying prone to esca

neutral with light simple cherry fruit accumulates sugar very fast -> used for Recioto

Molinara

high yielding, decreasing planting bc pale color acidity, red berry, light

important part of Bardolino blend ~40%

Nebbiolo

early budding (spring frost) vigorous:

needs regular canopy management to avoid unripe fruit due to shading

cluster thinning (time consuming) for best quality

late ripening (rain at harvest)

mainly grown in Cueno province esp Langhe but also northern provinces of Piemonte produce the finest most perfumed wines on calcareous marls

given the best south/southwest facing sites in Langhe to fully ripen

vines trained high as the first few buds infertile and needs to be pruned with more buds st further up the shoot will bear fruit

single Guyot the most common form of training -> mechanical trimming of canopy excessive sun exposure of grapes problematic

clonal research aimed at producing wines of deeper color but could lose aromatic intensity

some growers eg Gaja prefer mass selection to propagate vines with low vigor (concentration++), open bunches (fungal diseases—) and small berries (depth of color++)

Barbera

most grown variety in Piemonte: area 3XNebbiolo

concentrated around Asti, Alba, and Monferrato

best from Asti, and its subzone Nizza now DOCG

best sites in Alba reserved for Nebbiolo even though Barbera also grown

grown in Langhe can be of high quality bc less sensitive to site than Nebbiolo

early budding (spring frost)

vigorous

disease resistant

subject to fan leaf virus

grow on a range of sites/aspects

high yielding: high yields of acceptable to good vs prune hard for high concentration

late ripening but before Nebbiolo

high acid, low in tannin, made in a range of styles including traditional lightly sparkling
most made still now for early drinking no oak

highly concentrated Barbera wines aged in French barriques are made following
success of Giacomo Bologna

added oak tannins adds to body and aging capacity but cost++ esp with new oak
Barbera d'Asti DOCG: max yield 63, aged for min four months

Nizza DOCG: max yield 49, aged for 18 months, 6 of which in oak

Piemonte DOC: mx yield 84, can be of low concentration

Dolcetto

early ripening can be on cooler sites

prone to fungal diseases

fragile as buds easily break

low vigor, ripening can be blocked by prolonged spells of cold weather -> reduced
planting area <- much higher prices obtained for Nebbiolo

reductive in winery: requires frequent pumpovers or rachs and return to introduce oxygen and avoid off flavors

for fresh primary fruit: mid range fermentation temperatures, short times on skins 7- 15 days and soft extraction methods to avoid extracting naturally high tannins, aged in SS or cement vats to preserve primary fruit

Freisa

low tannin, highly aromatic

Cortese

high yielding

light intensity aromas of lemon, apple/pear, white blossom, high acid, med alcohol, light body

Thin skinned: grey rot in rain

after pressing, must fermented at mid-range temp - top wines may undergo a few hours of pre fermentation maceration to increase aromatic intensity

typically aged in SS for primary fruit for early drinking

Top wines aged in bottle for tertiary notes

Gavi (Cortese di Gavi) DOCG: 100% Cortese from fruit within the municipality 67 hl/ha

Castellari Bergaglio and La Scolca

Arneis

most in Roero

light intensity, white blossom, chamomile, white peach, lemon, med- acid

acid drops very quickly thus must be picked asap

oxidises easily: care in winery

Roero Arneis DOCG: min 95% Arneis, 70 hL/ha, became popular from 1980s despite growing difficulties

Vietti and Bruno Giacosa

Sangiovese

~10% all vines in Italy, most planted variety in Italy, widely grown in central/southern Italy

names: Morellino di Sansano, Prugnolo Gentile in Montepulciano, etc.

difficult to grow: early budding (spring frost), late ripening (affected by early autumn rain), best on sunny south and south east facing slopes where best shot to ripen grapes for better quality tend to grown 200-550m above sea level at harvest time climate warming -> higher sites or less sunny aspects

best on friable, shale, limestone soils - excellent drainage; reasonably good on clay vigorous - canopy needs trimming regularly to avoid shading

thin skin - botrytis, high-yielding -> growers have to decide whether to produce high vol or raise quality by pruning, cluster thinning, green harvesting

main training type: cordon pruned to spurs or cane pruned with VSP

large choice of clones available

high yielding choices

moderate yielding higher quality clones

vines created by massal selection from best performing plants

Chianti Classico 2000 project produced seven clones widely planted -> aiming for smaller berries, thicker skins, more open bunches to produce wines with deep color, more flavor intensity and greater disease resistance, less vigor

Esca - significant hazard in recent years -> growers avoid large cuts in old wood to reduce vine vulnerability, more skilled pruning methods

Wild boars do damage in vineyards - fencing

Trebbiano Toscano

late budding

vigorous high yielding - very popular in the past when quantity trumps

prone to downy mildew, eutypa dieback, but otherwise good disease resistance ripens well in sunshine and heat while retaining high acidity

aka Ugni Blanc for Brandy

on decline bc lacking intensity/flavor, increasing demand for red

high acid -> important part of Vin Santo, blended with other local grapes

Blending grapes of Sangiovese

Most Tuscan DOC(G)s allow Sang to be blended with a small % of black grapes: local, international CS, CF, Merlot, Syrah

Canaiolo Nero

used to be most popular variety in Chianti before 19th C but now merely a blending option

red berry, floral, light tannins -> promote red berry and floral notes in the blend

Verdicchio

needs to be given space, as the first four buds are sterile -> planted at low densities late-ripening, retains high acidity, needs to be given a long time in the vineyard to ripen fully to make high quality wines -> exposes the crop to risks of late season rain susceptible to both mildews and botrytis

pale lemon color, M- aromatic intensity, white flower, apple, lemon, fennel, almond, slightly bitter finish, high acidity, medium body

most entry level Verdicchio does NOT go through malo to preserve the crisp high acidity

aged for 4-6 months in stainless steel, bottled for early release and consumption some choose to put riserva wines through MLF for creamier acidity

Riserva wines will often be aged on the lees in old oak barrels for additional texture, not oak flavours

long ripening season can produce wines with high fruit concentration and high acidity

can be aged for a decade or more -> dried fruit and mushroom tertiary notes

Pecorino

mostly south of Marche, farther south in Abruzzo

high disease resistance

like verdicchio, best trained long (Guyot or pergola) bc sterile buds near the trunk clonal selection has focused on rectifying its low productivity

ripens early, avoiding late season rain

vinified before other local varieties creating space in winery

high in alcohol eg 14.5% due to low productivity, can be balanced by high acidity herbal notes: sage, thyme, mint, crisp apple, pear fruit, medium bodied

sold as Marche IGT, or if grown within Offida area in line with regulations, as Offida Passerina DOCG

Some DOCG wines released early to retain primary fruit while a minority are aged for 12-18 months in old oak barrels for additional texture

became hip since millennium

Passerina

also grown in Marche and Abruzzo

good disease resistance and high production

ripens later than Pecorino, more vulnerable to late season rain

high acid, but can lose it quickly once fully mature -> harvest timing important ripe lemon, yellow apple

sold as Marche IGT, or if grown within Offida area in line with regulations, as Offida Passerina DOCG

Biancame

fresh, crisp for local

Trebbiano Toscano

locally

Montepulciano

key black grape for quality and quantity

in Marche oft blended with Sangiovese

high quality wines tend to be 70-85% Montepulciano

resistant to botrytis and downy mildew

susceptible to powdery mildew

needs a long season to ripen fully to avoid bitterness

tends to ripen unevenly within individual bunches -> lower quality or need to select carefully

deep ruby, susceptible to develop reductive sulfur compounds during winemaking -> requires freq aeration

maceration depends on style:

short 4-5 days for simpler, lighter wines: ripe, medium intensity red cherry fruit, no oak, medium body/tannin

20 days for higher quality wines: pronounced intensity, medium+ intensity red cherry, black plum, oak (typically large), medium+ tannins

care must be taken not to extract too much tannin

a major part in Rosso Piceno DOC (35-85% Montepulciano) covering a large area of middle of the Marche

Grechetto

Grechetto di Orvieto

white, thick-skinned, resistance to fungal disease -> late harvesting, resistance to downy mildew

Sagrantino

speciality black variety of Umbria

needs full sunshine and heat to ripen

moderately productive

hillside sites, 220–470m, for the best sunlight interception and good drainage Guyot or cordon with spurs and VSP trellised

tiny spiders that can live on the hairy underside of its leaves and reduce vegetative growth, vine moths and downy and powdery mildew

very tannic, high acid, black fruits - require long ageing in the production phase and often in bottle before the wines are ready to drink

Trebbiano di Toscana

Tuscany

Malvasia Bianca di Candia

disease resistant

high yielding

juice prone to oxidation in winery thus handle carefully avoid losing freshness too deep in color

med- intensity lemon apple med+ acid med+ alcohol light body

Malvasia del Lazio

Muscat of Alexandria X local variety

grapey and peachy

must be harvest at exactly correct time as its acid drops fast once ripe

commonly planted in Lazio until 1960-70s but replaced bc low yields/disease resistance

Cesanese

black, semi-aromatic, very late ripening, high yielding, high quality potential prone to powdery mildew

vulnerable to autumn rains and failing to ripen fully -> low quality

some inland some higher slopes diurnal range fresher fruit higher acid DOCG
Cesanese di Piglio: min 90%

Pronounced red cherry, rose petal, med tannin, high alcohol

Montepulciano - Marche

Trebbiano Toscano - Tuscany

Trebbiano Abruzzese

Relationship to above not clarified, oft called Trebbiano d'Abruzzo as the DOC name not the varietal

mid-late ripening, vigorous, highly productive

well suited to growing on pergola systems as high training appropriate to vine size and provides shade

prone to powdery mildew Chard, Sangiovese, Pecorino

most 100% varietal or 85%+authorized blending varietal

by planting: Aglianico, Falanghina, Barbera, Malvasia, Sangiovese, Greco;
Barbera/Sangiovese for local and bulk

Falanghina

Important: widely planted white, rise in popularity around the world since 1980s esp in hospitality

good disease resistance but can shrivel at the end of season: harvest timing important
mid late ripening: sometimes threatened by autumn rain

med intensity, apple, peach, grass, med+ acid, unoaked

Falanghina di Sannio: largest DOC featuring Falanghina, max yield 84 hl/ha, 1/3 all Falanghina plantings in Campania

Campi Flegrei: lower abv, 12-13%, bc windier conditions, max yield same

Greco

difficult to grow as prone to grey rot, 2 mildews, low vigor/productivity

heat tolerant, drought resistant: suitable for warm region

Guyot or cordon-trained spur-pruned: some mechanisation on less steep slopes long growing season to develop depth of flavor

Greco di Tufo (name of town not soil) DOCG

small densely planted with limestone, clay soils: water drainage and retention

max yield 70

less than Falanghina more than Fiano in Campania

deep lemon, high abv, oily texture, floral, stone fruit, smoky, unoaked, vg/o

Fiano

1/3 planting of Falanghina but held in high regard

rescued from neglect by Mastroberardino family after WWII Guyot, cordons with VSP

prone to 2 mildews

late ripening with thick skins: resist botrytis

Fiano di Avellino DOCG

max yield 70

Med-/med intensity, floral, peach, hazelnut, med+ body, med/med+ acid, waxy diff soils
diff expressions: open sandy soils with fast drainage gives light fruity wines; clay
dominated soils with water retention gives weightier wines

vg/o, best can age for 8-10 years, mostly in SS some in wood

Aglianico ('hellenic')

early budding: spring frost, late ripening: long season to ripen tannins

vigorous

prone to botrytis: late season rain

not Greek, prob an ancient from southern Italy

spurred cordon or cane pruned with VSP at med density: some mechanization
med+/pronounced intensity: rose, red/black, high acid/tannin

high quality on cool slopes 200-600m: longer season more intense flavors Taurasi
DOCG

85% Aglianico (pedirosso blended in)

max yield 70

3 years aging, min one in wood; riserva: 4 years, 18months in wood long maceration on
skins - >= 20 days

aged in French oak barriques or in large oak casks

vg/o, 50/50 domestic/export: US

Piedirosso

old Campania varietal, from Vesuvius area

pale ruby, fresh, med+ acid, med tannins, red plum/cherry

mainly grown around Naples: Campi Flegrei DOC ($\geq 50\%$ Piedirosso, IRL 100%),
Vesuvio DOC ($\geq 50\%$ Piedirosso, IRL 100%), islands of Ischia, Capri

adapted to heat/drought, thrives when 600mm rainfall and windy conditions

open bunches, thick skinned berries: botrytis resistant

dry windy conditions: mildews not a problem

in 2 DOCs many on own roots as phylloxera never spread to sandy soils at low
densities used to be trained high with bunches for high vol production but now moved
to Guyot or spurred cordons for better fruit concentration

harvest late but still at 12-13%

used to make easy drinking varietal wines and to soften Aglianico-based wines +
perfume/freshness

Primitivo

high yielding aka Zin

early ripening: avoids autumn rains; early budding: prone to spring frost

prone to drought, poor flowering, fruit set in rainy/humid years

production levels vary

looser bunches with smaller berries: more disease resistance than Zin in CA

uneven ripening: strict sorting for high quality, cost+++

accumulates sugar easily thus high abv

dry on vine towards harvest: high abv, timing critical to avoid jammy/dried flavors

old vines: low density bush vines: shade for fruit, make most of the low rainfall

new vines for bulk: trellised - cordon trained or cane pruned with VSP for mechanization
Inexpensive wine vinified at warm fermentation temp with maceration on skins 7-10 days, short period aging ~6mon in SS or large cask

premium longer on skins aged in barriques for 12 months

Primitivo di Manduria DOC:

85% Primitivo

max yield 63

Riserva: 2.5 years, 9 months in wood, min 14%

Gioia del Colle DOC - red wine

50-60% Primitivo with Montepulciano, Sangiovese, Negroamaro + ≤10% Malvasia max yield 52

Riserva: 2 years aging, no requirement in wood

min 14% abv

hilly area slightly cooler 250-500m above sea level

Both DOCs make full-bodied high abv wines

med+/pronounced ripe/jammy red, med acid, med/med+ tannins

Gianfranco Fino (Primitivo di Manduria) and Polvanera (Gioia del Colle)

many sites with old vines removed under EU wine pull scheme, popular again bc CA Zin

Negroamaro

Salento peninsula

high yielding, disease resistant, drought resistant, retains acid: suitable for hot climate
used to add abv/body to cooler region wines

Salice Salentino DOC

Salice Salentino Rosso DOC min 75% Negroamaro

90% Negroamaro if on label max yield 84

Riserva: 2 years aging, 6 months in large wood casks

red wines typically macerated on skins for 7-10 days, aged in SS for 6 months for inexp
or one year in oak for \$\$\$/\$\$\$\$

Med/high abv, med acid, med+ tannins, black

Rosato popular

Agricola Vallone and Leone de Castris (including its rosato)

Nero di Troia aka Uva di Troia

late ripening, prone to downy mildew

long season to dev full color: prone to autumn rain

uneven ripening, repeated passes when picking

med intensity red with black pepper, high fine grained tannins, med+ acid Castel del
Monte PDO

90% Nero di Troia if on label

DOC: max yield 91, mainly aged in SS for ~6mon

DOCG for Riserva: max yield 70, 2 years aging, one year in wood in barriques or large
casks

Rivera and Torrovento

Catarratto

high yielding, disease resistant, light intensity lemon herbal high acid med abv, inexp/g
Grillo

cross btw Catarratto and Moscato

moderately high yielding, heat/disease resistant: suitable for warm dry climate
overexpose bunches: loss of aroma

must oxidases easily thus modern protective winemaking techniques (opposite past and Marsala)

full body med intensity floral lemon, med body, high acid

g/vg

Marco de Bartoli: early champion, produces oak aged example \$\$\$\$

Inzolia or Ansonica

early ripening, drought resistant

early picking to retain acid

Med- intensity lemon, med acid (-> useful blending partner with higher acid Catarratto and Grillo) med body

Valle dell'Acate, Principi di Butera

Catarratto, Grillo and Inzolia allowed in many DOCs within island

Alcamo Bianco DOC (northwest): min 60% Catarratto, max yield 84

other DOCs give min % for any one variety or for a combo of the three varieties

Moscato

Muscat of Alexandria aka Zibibbo

heat drought resistant

a range of styles esp on Pantelleria island closer to Tunisia than Sicily, intense sunlight, heat, drying wind, low bush vines in individual holes to conserve water and protect from wind

three styles in Pantelleria

dry: SS ferment, release early to retain Muscat characters

late harvest: picked 1 week later than dry wine, fermentation stopped to retain RS for a sweet style

passito:

semi-(sun-)dried grapes, high RS

balance sweetness with sufficient acid being the challenge: some pick most fruits early for optimal acid, then dry in sun for 20-30 days to be added to the must of very ripe fruit picked at end of season

deep lemon, pronounced aromas of cooked orange, apricot, honey, sweet with high alcohol, vg/o, \$\$\$\$-\$\$\$\$\$

Donnafugata for all styles

Nero d'Avola - aka Calabrese

most planted in Sicily

grows well in hot climate, oft close to ground to max heat; adaptable thus also grows well in damper cooler sites

late ripening

vigorous: canopy management

prone to powdery mildew

uneven ripening affects yields YoY

med/deep ruby, red/black, med+/high tannins, med/med+ acid

much made as varietal wine - an option in Sicilian DOCs (max yield 70-77), oft produced as IGT or 'wine'

Gulfi (single vineyard)

Feudo Montoni

also blended with Frappato (strawberry, herbal, fresh red) in Sicily's only DOCG
Cerasuolo di Vittoria DOCG: Nero d'Avola 50-70%, Frappato 30-50%, max yield 52

COS

Planeta

also blends with international varieties

Nerello Mascalese

grown for vol production at high yields across Sicily but recent decades became high regarded from Etna

early budding: spring frost

yields vary YoY bc coulure

late ripening: early autumn rain

at alt on Etna 400-1000m: long growing season: intensity+++

prone to powdery mildew, botrytis bunch rot: deleaf around fruit zone at right time (if too early berries burnt, too late never ripen fully: unripe flavor harsh tannins) in cooler sites on Etna

med/pale ruby, high intensity red, violet, earth, med/high tannins, high acid, med(+) abv moderately tannic, must kept for short time on skins 10-15 days to avoid over extracting tannins (Graci for much longer 30-90 days for smoother tannins)

Etna Rosso DOC

min 80% NM, rest Nerello Cappuccio [color, red berry]

best wines from old 60-100 year vines - high concentration low yields moderate/steep slopes: hand work

max yield 56

Riserva: 4 years aging, one year in wood

pale ruby, med intensity red, high acid, med+/high tannins, aged in large neutral oak or 500-600L barrels

vg/o, \$\$\$-\$\$\$\$

Carricante

>=60% in Etna Bianco DOC, ~100% in better producers, usu blend with Catarratto prone to fungal diseases

grows well at high alt 1000m where black grapes fail to ripen

large diurnal range: high acid

malo normal to reduce acid

typically aged in old oak for texture

med intensity lemon green apple, high acid, med abv

much lower vol than but of same quality price as Etna Rosso

planting: Granacha Tinta, Vermentino, Carignano, Monica Nera, Nuragus, Sangiovese Cannonau -

Grenache Noir:

Cannonau di Sardegna DOC

can be grown anywhere on the island

Classico zone more restricted

max yield 77, 63 in Classico zone

2 years aging, 6 months in wood for Riserva, 12 months in wood if Classico Riserva
g/vg, dry/sweet fortified also made for local sale

Sella & Mosca, Argiolas

Vermentino

Rolle in southern France:

early budding: spring frost

prone to downy mildew, EU grape moth

mid ripening: less prone to late season rain

best on sunny exposed sites with poor soils

med intensity lemon acacia riper examples with tropical notes, med abv, med+ acid

g/vg

short period of skin contact - 24 hours

ferment at cool temp in SS to retain primary fruit

some vg aged on lees for 6 months for a fuller body mainly in SS bc cost and avoidance
of overwhelming delicate aromas

Vermentino di Sardegna DOC:

anywhere on island, high max yield 112 thus low concentration/flavor Vermentino di
Gallura DOCG:

northeast corner, Sardinia's only DOCG, max yield 63

Carignano - Carignan:

southwest corner

heat drought resistant: thrive in hot dry summers with drying winds from sea (reduce
fungal)

poor sandy soils help restrain natural vigor

Carignano del Sulcis DOC

bush vine most common, required for Superiore category within DOC: suited to dry climate, restrain natural vigor

limited irrigation permitted to allow vegetative growth but not after veraison during final fruit ripening

max yield 77, 52.5 Superiore

2 years aging for Superiore and Riserva Agricola Punica and Santadi

both bush and trellised vines (replacement cane aka Guyot with VSP or cordon-trained spur pruned) widespread

top six: Airen, Tempranillo, Bobal, Garnacha, Macabeo, Monastrell

Airen:

center of Spain in Castilla-La Mancha, inexp neutral whites for early consumption, much distilled into Brandy de Jerez

Tempranillo:

Inexpensive fruity reds

prestigious Rioja, Rivera del Duero, Toro

dominance is recent, closely associated with growth of Spanish wine in int'l markets and consumers' association of Tempranillo with Rioja

med/high yielding ability helped growers

quality focused growers limit yields in order to produce its finest wines in warm climates where there's cooling influence from altitude or cool winds

single variety wines and blends

Bobal

black varietal mainly near east coast producing red/rose wines

Garnacha Tinta

produces red/rose wines predominantly in central north and north east
Tintorera is Alicante Bouschet

Macabeo

white mainly in Catalunya for still (early consumption) and Cava
aka Viura in Rioja: in exp neutral wines and in premium wines fermented/matured in oak

Monastrell

red wines predominantly in areas around Valencia and Murcia - well suited to the warm
Med climate as its late ripening and needs heat in late growing season to ripen fully

91% black

Tempranillo

88% plantings of black

dominance only recent - 50 years 50/50 Tempranillo/Garnacha bc

Tempranillo is productive/high yielding thus many Garnacha vines replanted to
tempranillo, compounded by legalization of irrigation bc drought resistant (Garnacha)
less important

suited to Rioja Alta, Alavesa where its able to ripen in cooler higher alt cool clay soils
dominant in most Rioja red: raspberry black plum med/med+ tannins/acid some make
single varietal

Garnacha

second most planted, 8% black plantings suited to warm dry Rioja Oriental raspberry
lower tannins fuller body

Graciano

late ripening, drought resistant

small yields, prone to fungal
high acid/tannin, fresh black fruit to Rioja blend <2% plantings, occasionally single varietal

Mazuelo aka Carineno, Carignan

high acid to the blend
<2% plantings, occasionally single

Maturana Tinta aka Trousseau

permitted in Rioja since 2009

tiny but increasing planting
deep purple color, high acid, fresh strawberry blackberry permitted but small plantings of Cab Sauv

Albarino

well suited to damp climate,
thick skin, less prone to damage from rot,
early to mid ripening: can fully ripe with a warm climate and improved viticulture
usu as single varietal wine

Viura

aka Macabeo, Macabeu in Roussillon
most planted white, 70% white plantings, 6.5% total plantings
late budding/ripening, prone to botrytis, best suited to warm dry sites neutral grape: wide range of styles
high yields SS ferment: simple whites for early drinking
lower yields oak maturation: concentrated complex long aging

Tempranillo Blanco

white mutation of Tempranillo 1988, permitted in 2004
planting risen quickly now 12% white plantings - second most planted white high acid, lemon, grapefruit, pineapple

Malvasia, Garnacha Blanca

typically as blending components to add diversity (acid of GB) mostly in oak matured \$\$\$/\$\$\$\$
Verdejo, Sauv Blanc
single varietal or add aromas to blends with Viura in inexp unoaked styles

Monastrell like Bobal

late ripening well suited to hot dry climate
retain acidity, drought tolerant
75% plantings in DO
vineyards tend to be planted at low density with bush vines
red wines labelled Alicante DO: $\geq 80\%$ Monastrell in the blend of Alicante Bouschet,
Garnacha, Bobal; full body, dry, high alcohol, high tannins, ripe black fruit. Usu American oak.
Some aim for fresher fruit at lower alcohol.

Loureiro (Loureira in Rias Baixas)

most widely grown grape, grown throughout the region mostly towards the coast; mid-ripening;
M+ acidity, citruses, pear, floral, herbal Pederna (local name for Arinto) second most planted:
mid-ripening, productive, less aromatic, subtle citrus, apple, high acid

Alvarinho (Albarino)

third most planted: citrus, peach, tropical sometimes, M+ body, M+ to high acid; traditionally
grown exclusively in Moncao e Melgaco in north Vinho Verdes, now more recognized and more
planted elsewhere, a named variety on wine labels since 2016

Avesso

late ripening, can fail to ripen unless weather is warm and dry, grown inland south of the region
esp Baiao; lower acid, full body, citrus, stone fruit

Trajadura (Treixadura)

low acid, apple, peach, usu blended with high acid varieties

Vinhao (Sousao in Douro, Souson in Galicia) most planted black varietal, deep color, cherry fruit, high acid

single varietal wines typically of Touriga Nacional or Tinta Roriz are rare

common grapes similar to in Port: Touriga Nacional, Touriga Franca, Tinta Roriz, Tinta Barroca, Tinto Cao

Touriga Nacional and Touriga Franca

tend to retain acidity well and give ripe but not jammy flavors of black fruits, popular lead grapes in blends

Touriga Franca:

M body, M alcohol, red/black fruits, floral notes - violet, rose, or orange blossom.

Sousao

plantings increased both for Port and Douro wines: high acid, brings freshness in warm years

the DOC permits a large range of other Portuguese varieties

grapes for Douro DOC whites are traditional Portuguese varieties, many native to Douro Valley

Viosinho:

full body, flora, stone fruit, can lack acidity

Rabigato: high acid, citrus, floral

Gouveio aka Godello in Spain

M+ acidity, citrus, stone fruit

Moscatel Galego Branco - Muscat Blanc a Petits

Grains

++ aroma intensity, tend to be grown at the highest altitudes <- cooler day, night time conditions that help retain acidity

tend to be made from grapes blended from a range of sites though some made from a single vineyard plot

generally aim for ripe but not overripe grapes, and a blend of sites (and grapes) help achieve this despite vintage variation <- aspect, altitude, distance from coast | northfacing, higher altitude, west of region give cooler conditions

~80% production red wines of key black grapes:

Touriga Nacional

deep color, high tannins, high acid, black fruit, floral, herbal notes -> structure

Tinta Roriz

ripens earlier, deep color, M/M+ tannins, full body -> structure

Jaen aka Mencia

moderate acidity, raspberry, blackberry; as a single varietal sometimes made by carbonic maceration to produce a fruity wine for early consumption, sometimes used for Rose -> soften and lend ripe fruity flavours to red blends

Alfrocheiro

M tannin/body, strawberry, blackberry; as a single variety made in a soft fruity style for early consumption, sometimes for Rose -> soften and lend ripe fruity flavours to red blends

Overall Dao red wines tend to be less full bodied and intense than Douro red wines, oft with fresher flavors and higher acidity

red wines used to be excessively astringent and lacking in fruit from long periods of maceration followed by extensive maturation in old oak -> now shorter maceration and aging in oak is common <- new oak typical but some producers have started to reduce %

Encruzado

the key white for high quality wines, M/M+ acidity, full body, lemon/peach/floral; SS fermented or matured in oak sometimes with lees aging and stirring for texture; oak-fermented ones are capable of aging well in bottles and develop nutty characters

Malvasia Fina (the same as Boal in Madeira), Bical and Cercial (for characteristics see Bairrada) often blended or with Encruzado

Baga

- the dominant red - "Portuguese Nebbiolo"

high acid and tannins, medium body with cranberry, plum, can be astringent when young but softer and more complex with aging

a significant amount of Baga grown at high yields was/is sold for the production of Mateus Rosé quality minded private companies

late ripening, productive -> careful site selection and limiting yields to ensure full ripeness

Ripen best on **limestone-clay soils**

optimum balance of water retention and drainage to ensure vine has enough water to continue ripening throughout the growing season, as photosynthesis can stop in drought, but not so much as to get overly vigorous

Light-colored soils reflect solar energy back onto the vines aiding the ripening process

by comparison, sandy soils are too dry and often better suited to the grape varieties below green harvesting may be used to enhance ripening of the remaining bunches and harvest fruit goes to sparkling wine

fermented on stems traditionally -> reputation of wines best drunk after long bottle aging modern producers de-stem, though a return to using a proportion of whole bunch or adding back a proportion of stems -> fresher character, enhanced aroma of whole bunch, greater structure (use of stems -> tannins)

SS/open concrete vats/lagares for fermentation

maturation commonly in 500-650L French oak - traditional producers still use toneis from Portuguese oak or Brazilian hardwood - others use foudres made from French, Italian or Austrian oak

Maria Gomes (Fernao Pires)

most planted white variety in Portugal, early ripening (favorable in Bairrada's wet climate), high yielding, citrus, floral, M(+) acidity if picked early but lose acidity quickly if left on vine longer

Bical

early ripening, peach, sometimes tropical fruit, M(+) acidity if picked early but lose acidity quickly if left on vine longer

Arinto

apple, citrus, used in blends to add acidity

Cercial

apple, citrus, used in blends to add acidity
international varieties also allowed eg Chard, Sauv Blanc
inexpensive whites usu from sandy soils, SS fermented at cool temp and bottled soon after
medium priced and above oft from clay-limestone soils and may see oak for a short time
Quinta das Bageiras and Filipa Pato & William Wouters

a wide range permitted in DOC, single varietal are the exception both reds/whites black grape varieties make >75% plantings, oft blends

Aragonez:

early ripening, if left on vine can be overripe, best grown in cooler areas and sites

Alicante Bouschet:

deep color, acidity, tannins, red/black berry fruits to red blends

Trincadeira:

very susceptible to rot but grows well in dry climate in Alentejo, high yielding <- need to be limited if it is to fully ripen grapes, M tannins/acid, blackberry, spice

Touriga Nacional sometimes +tannind/acid

Syrah, Cabernet Sauvignon (waning), Petit Verdot (color, spice, tannin) increasing Cartuxa, and Mouchao

Castelao (Periquita)

Deep color, full body, red berry, oak matured - spice

Best in warm sandy vineyards on the plains for concentrated age-worthy wines

On limestone slopes: lighter for early drinking

Roupeiro

most planted white grape, retains acid, prone to rot, well-suited to warm dry Alentejo; citrus stone fruit but loses primary quickly with age

Arinto (Pederna in Vinho Verde)

retains acid

Antao Vaz

drought tolerant, made in a range of styles, can lack acidity unless picked early

Chard, Viognier, etc., Alvarinho+++ permitted

Relative newcomers Touriga Nacional and Aragonez and historic local white grape Arinto thought to have highest potential for quality; Syrah, Cabernet Sauvignon, Pinot Noir, Sauvignon Blanc and Riesling are also popular among international grapes

Out of the DOCs, Alenquer and Bucelas on the eastern side of the coastal mountains best known

Alenquer: full-bodied red wines in this sheltered location often from Touriga Nacional and Aragonez, [though many black and white varieties are grown]

Bucelas: high acid wines from Arinto $\geq 75\%$ of the blend. Some SS fermented bottled soon.

Others: lees contact and/or oak

Colares and Carcavelos are much smaller coastal DOCs of great historic importance almost subsumed by Lisbon's suburbs

Cool, foggy coastal climate and ungrafted old bush vines on the deep, phylloxera-free sandy soils of Colares of interest to new winemakers -> fresh, high acidity red and white wines from rare local grapes

US

2/3 grapes in Cali used for wine, 1/3 used for table grapes/raisins; 63% black

Chard, Cab Sauv most planted, each at 20% total planting of state; Chard slightly more but Cab Sauv rising

Cali Chard made in a full spectrum of styles - gradually those specializing in Chard became nearer the coast or with coastal influence at high altitude

Cab Sauv styles vary a lot too - SITE can be influential; vineyard management and harvesting dates are important too - with green harvesting and long hang times [leaving the grapes on the vine well into ripeness and perhaps extra-ripeness] High percentages of new French oak are common, but maturation times are often shorter than they once were, and

generally the balance of fruit and oak is being better managed now than in previous decades Pinot Noir plantings have grown rapidly in the last 20-30 years, from relatively cool sites Zin the signature variety not widely grown elsewhere except in Puglia; considerable plantings of 100+ old vine Zin; prone to uneven ripening

Zin usu from Central Valley also commonly made into Rose - White Zin - with a short maceration on the wines before fermentation in SS and cool temp, and fermentation stopped early to produce a medium dry wine oft with low abv @ 10.5-11%

Merlot was incredibly popular in 1990s - early 200s but trends changed and planting declined; but a number of producers make premium wines from the grape, often in areas with a more moderate climate, such as Stag's Leap District and Oak Knoll District in the Napa Valley Colombard aka French Colombard in CA is a neutral white grape commonly used for IGP wines in South West France. Generally grown in Central Valley to be blended into bulk wines its name rarely seen on labels instead "fruity wine" or "dry white"

Syrah risen in popularity, best in areas with cooling influence; Rhone rangers also make Grenache, Cinsaut, Viognier, Marsanne, Roussane

Pinot Gris plantings increased as well - dry but fruity style

Sauv Blanc generally in a fruity style SS fermented and released early; some mature in oak -> greater body/texture with toasty flavors, occasionally labeled Fume Blanc but name does not necessarily mean wine has been fermented/matured in oak

Cab Sauv:

finest \$\$\$\$ single or blend with Merlot, Carmenera, Syrah

best sites traditionally near the Andes where poorer soils keep vigor in check and cool nights slow ripening and help retain acidity

also used for bulk simple fruity wine esp in flatter parts of Central Valley less structure/intensity/complexity

inexpensive Merlot mainly from Central Valley popular on export markets: soft tannins, med body, dark fruit, also widely used in blends; low yielding complex full body riper fruit \$\$\$\$ also made

Carmenere:

officially identified 1994 planted as Merlot previously

oft in blends, increasingly as a single varietal

site selection important: ripens 2-3 weeks later than Merlot and needs warm (not hot) sunny sites otherwise overly herbaceous with harsh tannins, but if too ripe can be alcoholic

styles evolving bc clonal selection research, site selection, harvesting dates, less extraction and new oak in winery

Syrah:

first planted in mid 1990, increased rapidly diff location diff styles:

cooler-climate style of San Antonio, Casablanca, Limarí and Elqui: higher acidity, fresh black fruit, pepper and clove

warmer-climate style of the Colchagua Valley, fuller-bodied: more intense, riper black fruit

Pinot Noir:

improving rapidly in Chile esp in cooler areas eg Casablanca and San Antonio
bests: red fruit with herbal characters, med/high abv

Sauv Blanc:

most planted white, thrives in cooler areas eg Limari, Casablanca, San Antonio some use lees contact and oak aging to increase complexity

large vol inexpensive good quality from Central Valley

cool coastal areas eg Limari increasingly recognized as source of very good Chardonnay:
med+/high acid, citrus, stone; large amounts of inexpensive from Central Valley

Malbec:

signature, ~20% total vineyard, plantings increased over 250% since 2000 driven by export
vigorous, mid-ripening, in warm conditions: deep colored full body high levels of soft tannins
high alcohol, blackberry/black plum <- this style a hit in export <- key factor in the rise of
popularity of Argentinian wine abroad

can produce a wide range of styles, still used blends usu with Bordeaux varieties, Bonarda and Syrah at/in different prices/styles, also for fresh fruity roses

different microclimates affect style: cooler sites: lower abv, m+ acid, m+ tannins, fresh red/black fruit, floral, herbal; warmer sites: fuller body softer tannin, lower acidity, riper fruit; producers with vineyards in more than one areas oft blend wines to take advantage of different characteristics but single vineyard wines increasingly common as producers want to highlight terrior

cuttings of Malbec taken in France arrived before phylloxera so diversity of high quality planting material, honed by clonal research and massale selection

Malbec clones in Argentina found to have smaller berries and bunches and softer tannins than in France

Bonarda

second most planted black grape, "Bonarda Argentina" (cf. unrelated Bonarda in Italy) late ripening, mainly in San Juan and warmer areas in Mendoza, high yielding, used to produce bulk wines; when yield limited -> more intensity/structure

Deep color, red/black fruit, m+ acid, m tannins/alcohol

oak can overwhelm Bonarda so if used large/old
its fruit nature and color intensity: popular blending partner usu with Malbec or Cab Sauv
recently some started making more complex wines with riper black fruit and spicy characteristics
esp for low yielding sites and old vines eg in Maipu, Lujan de Cuyo, east of Mendoza
85% consumed domestically

Cabernet Sauv

more susceptible to extremes of temp and fungal disease than Malbec -> careful site selection
is important

Typically blended with Malbec in top wines

increasingly made premium single varietal

Competition with CS from other countries: here ripe tanins, black fruit spicy, no marked
herbaceous notes

Syrah

successful in hotter sites of Mendoza and San Juan - more widely planted here than Malbec ->
full body high abv ripe black fruit; elegant fresh fruit firmer tannins in cooler areas

Tempranillo; Merlot (vineyard area decreasing), Pinot Noir (planting increasing, esp succesful in
Patagonia, high elevation vineyards of Uco Valley -> concentrated fruity wines), Cab Franc -
considerable potential here -> distinctive concentrated style either blended or single variety,
Petit Verdot & Tannat both on the rise

Pedro Gimenez

(not the same as Spanish Pedro Ximenez)

the most planted white

neutral grape traditionally used to produce simple wine for domestic consumption

high quality whites gaining recognition, esp in cool sites eg highest alt sites in Uco Valley

picking grapes earlier, fermenting at cooler temperatures -> fruitier fresher higher acid, lower
alcohol

some blends emerging, esp including Torrontes

Torrontes (Riojano):

Torrontes Riojano, Torrontes, Sanjuanino, Torrontes Mendocino
best of three, second most planted, most distinctive white variety

native natural cross of Muscat of Alexandria and Criolla Chica dating back to 18th C; strong, floral reminiscent of Muscat

vigorous, high yielding: widely planted in Mendoza, San Juan, La Rioja

early ripening grape variety -> overripe by heat -> alcoholic lacking in acid with a bitter finish

recently investment/developments in grape growing and winemaking increased its profile, reducing yields, earlier harvesting, temp control during fermentation -> fruitier (lemon grapefruit peach) fresher with lower abv rather than overtly floral

esp successful in Cafayate (Salta) increasingly quality wines from other cooler higher sites esp in Uco Valley

Most Torrontes tend to be drunk young, but some fermenting small amounts in oak to blend in with unoaked wine to produce more age-worthy wines; usu into single variety, some blend it with other varieties esp Sauv Blanc, fragrant, sweet, late-harvest wines as well

Chardonnay: widely planted, a range of styles, premium from cool sites eg Uco Valley: m+ acid, ripe stone/tropical fruit, subtle spice from oak maturation <- small % of new oak or 100% old oak to not overpower fruit

Semillon, Chenin Blanc: traditionally important sources of inexpensive whites for domestic market tho some looking to produce high quality; also showing promise: Sauv Blanc, Viognier

Planting: Chenin Blanc, Colombard, Cab Sauv, Syrah, Sauv Blanc, Pinotage, Chard, Merlot
Chenin 20% planting, double Loire, other grapes 6-12% of total planting, 8 grapes >= 80%

Pinotage

bred at U of Stellenbosch in 1925 by crossing PN X Cinsaut, "Hermitage" in SA early budding - spring frost rarely a problem in warmer parts of the Cape where its grown

moderately prone to fungal disease

high sugar levels in small berries: high abv with deep color (with short time on skin

post ferment eg 3 days lighter style, 5 days full body)

Chenin -

high vol vs small vol premium

Fruit - high yield, spray regularly to avoid botrytis, minimal/no sorting VS low yield on old dryland vines, small amount of Botrytis may be allowed, careful sorting

Blend - >=85% Chenin VS 100% Chenin

Adjust - Acidification normal, no malo to preserve acidity, cultured yeasts VS no acidification, no malo, ambient yeasts (or cultured)

Ferment - Cool temp in SS or concrete VS cool temp in inert vessels including large used barrels, increasing use of eggs/amphora, some use new oak, most in barrels for better fruit- oak integration

Maturation - Rest in SS or old oak for a few months, might use oak chips/staves VS Lees aging 3-9 months for SS/concrete fermented wine, 10-12 months in old oak, eggs, amphora, French oak, Batonnage if richer

Sugar - RS adjustment using RCGM $\sim \geq 5$ g/L from 1.5-3 g/L depending on target market VS no adjustment

Stabilize Fine Filter - SFF VS S light fining filter

Bottle/Transport - in bulk bottle in final market VS bottled in SA, transported to final market

Style - acc/g, \$-\$\$ VS vg/o, \$\$\$-\$\$\$\$\$

DeMorgenzon and Ken Forrester

Pinotage

premium producers

Extraction: cold soak bf crushing to improve color extraction

Cap: pumping over/down usu at the start of fermentation (also for inexp)

Style - trad'l full body, high tannic, deep ruby, red plum, blackberry VS lighter more elegant, grapes on cooler sites, picked at lower levels of ripeness, med ruby, red fruit, med tannins

Ferment: 3-5 days on skins post fermentation (trad'l) VS no maceration on skin post fermentation (modern)

Maturation

Inexp: SS or used barrels, oak chips maybe used, early release 6-12 months after vintage

Premium: aged for 12-15 months in barriques (oft $\geq 50\%$ new), release 2 years after vintage; high % $\sim 75\%$ new oak used to be norm with Pinotage but many cutting oak content

Syrah

most widely planted 30% total vineyard area

adaptable variety planted in most regions in various styles

hotter Barossa Valley McLaren Vale: full body high abv, high soft tannins, pronounced dark fruit earthy spicy notes, leathery with age

cooler Yarra Valley and Grampians: less full body, med abv, less intensely fruity red black cherry black pepper

different qualities combined in multi regional blended wines

general trend: less intense, more approachable styles by reducing amount of extraction via whole bunch fermentation and/or less new oak (trad'l: American oak, French oak increasing)

vg/o: open fermentation tanks with manual or mechanized punch downs for soft extraction of tannins

widely used in blends - MSG, SViognier (cofermented in higher end, blended in inexp), alongside CS to soften and give body ~Merlot in BDX

Cab Sauv

popularity grew rapidly in 1980s overtaken by Shiraz in 1990s

outstanding single varietals (higher acid/tannin than Shiraz) and blends with BDX grapes and Shiraz

Coonawarra - eucalyptus

Margaret River - oft blended with Merlot, slightly riper with subtle herbal notes

Merlot

widely used in blends w/ Cab Sauv

single varietal wines produced in styles from med body, med tannins, red fruit to fuller bodied riper black

better clones raising quality

PN

widely grown in cool/moderate regions eg Yarra Valley, Mornington Peninsula, Tasmania

med body, med abv, med/high acid, red fruit

whole bunch fermentation for aromas, cold maceration to enhance color/flavors stem inclusion to influence tannic structure

French oak (used) maturation widely used, new oak usage reducing

Grenache

mainly used in Rhone blends with Shiraz/Mataro, increasingly as single varietal recognition of fruit quality from old bush vines esp in MaLaren Vale, Eden Valley, Barossa Valley

traditionally made in low acid, high abv, jammy fruit, new oak

modern style: fresh, higher acid, slightly lower abv, fresher red fruit, sometimes with % whole bunches or stem inclusion for aromas and tannins structure, old oak or large barrel for maturation

Chardonnay

Aussie's most planted white, almost everywhere

general style evolved from ripe oak to leaner style

Complexity, balance and texture: ambient yeasts, solids in fermentation, barrel fermentation, lees ageing and barrel maturation

Sauv Blanc

cool regions: Yarra Valley, Mornington Peninsula, Tasmania

hotter regions with higher yields for inexp

less herbaceous than Marlborough esp from Adelaide Hills reputed for best examples in Margaret River, mainly blended with Semillon for white Bordeaux blend

Semillon

blend with Sauv Blanc Chard

Barossa traditionally produced full body Semillon at higher abv, oak maturation, but not as age-worthy as Hunter Valley Semillon, some producers now pick early to produce lighter styles with little/no oak

freq affected by botrytis noble rot on some sites in Riverina of New South Wales where complex sweet wines

PG

pick early for Italian style, pick late for Alsace style

finest PG from Victoria, esp Mornington Peninsula and Tasmania

Riesling

Clare/Eden Valley, Great Southern, Canberra, Tasmania

mostly bone dry high acid tho some sweet LH

SS ferment for fruit/floral

\$\$\$\$ may be 100% free run juice: high in sugar/acid low in phenolic compounds eg tannins

experiment: pre ferment skin contact, lees aging for texture and weight