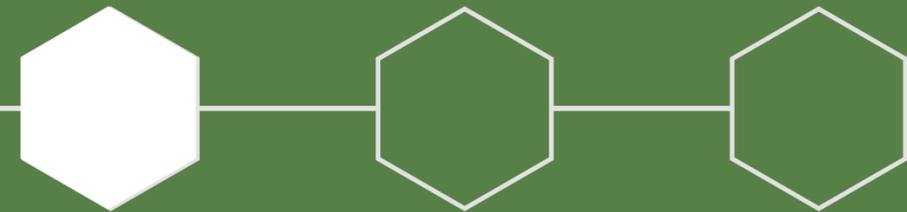


EARLY BUDDING

# CHARDONNAY

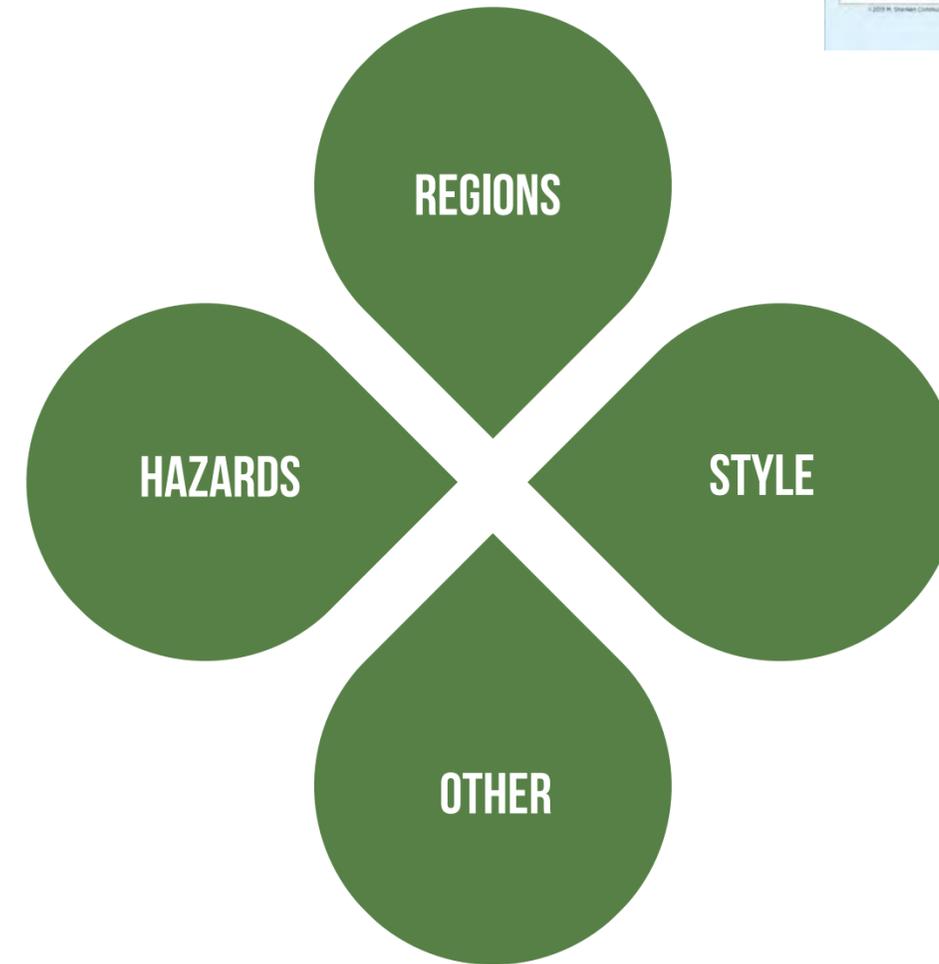
EARLY RIPENING



- FR: Burgundy, N Beaujolais, Jura, IGP Pays d'Oc
- DE, AT, GR, IT (NE, C, Sicily); ES (Navarra, Somontano, Catalunya); PT
- USA: California (more coastal AVAs); Oregon; Wash. State; NY State
- CA, CL, AR, SA, AUS (most regions), NZ (Gisborne, Hawke's Bay, Marlborough, ...)



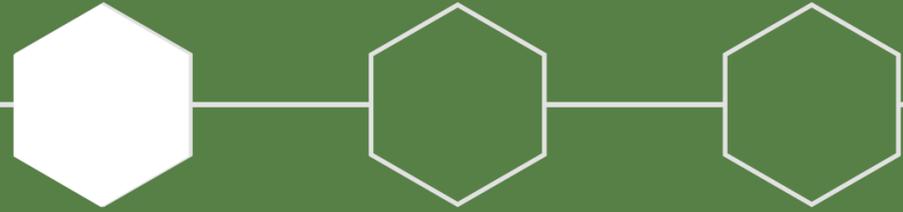
- spring frost
- millerandage
- powdery mildew
- grey rot
- bacterial diseases (Pierce's, grapevine yellows)



- wide range of styles and quality levels
  - unoaked, fruity
  - fermented / aged in oak, MLF
- in cool climates:
  - green fruit (apple, pear), citrus fruit (lime, lemon); wet stones;
- in warm climates:
  - ripe citrus, melon, stone fruit, tropical fruit

- versatile variety, suited to a range of soils and climates
  - many top-quality examples: from limestone/clay soils, e.g. Burgundy
- can produce relatively high yields without loss of quality

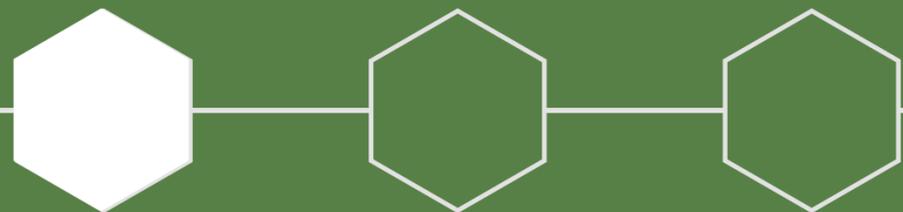




EARLY BUDDING

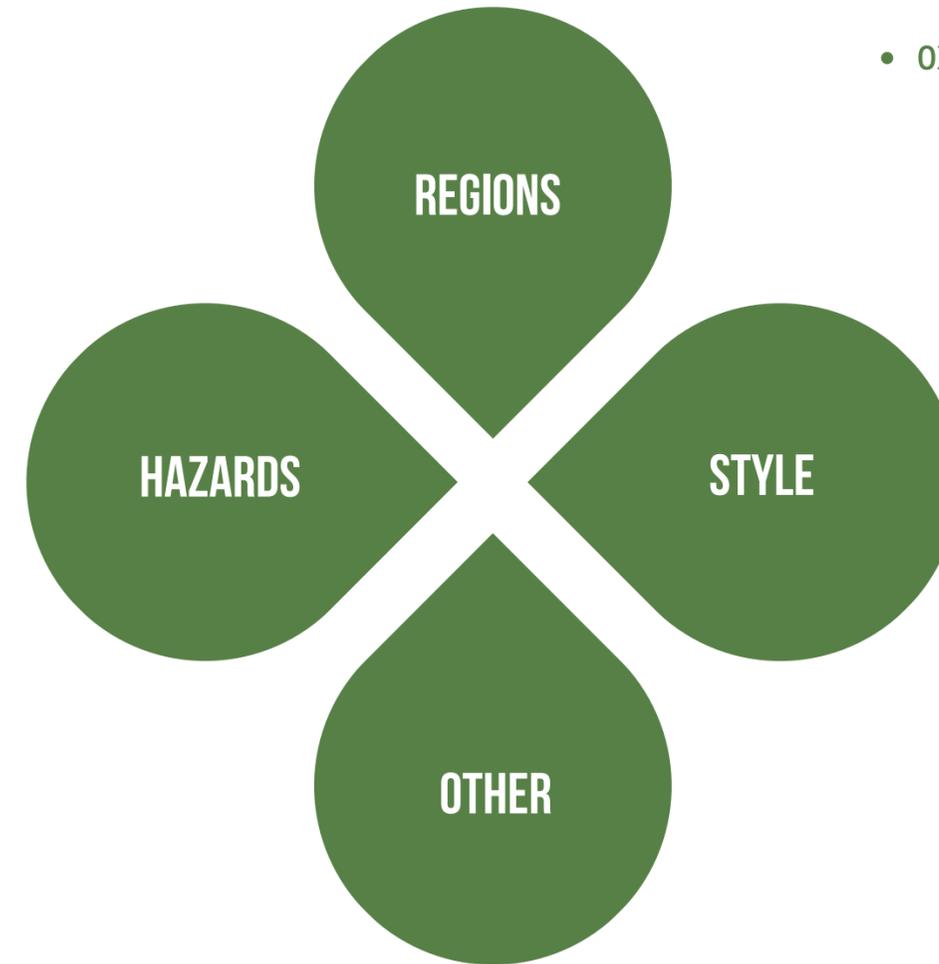
# SAVAGNIN / TRAMINER

EARLY RIPENING



- Jura, FR

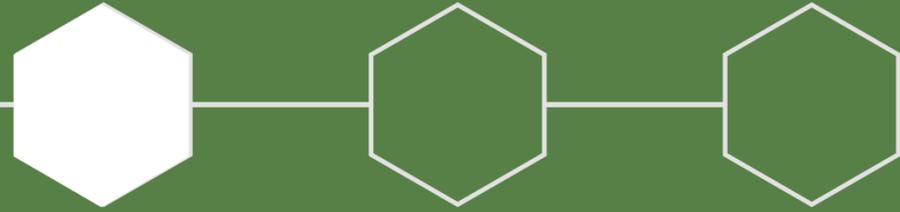
- spring frosts
- good resistance to fungal diseases (thick skin)



- conventional whites
  - high acidity
  - M- lemon/apple
  - M body, M alcohol
- oxidative styles
  - Vin Jaune:
    - M lemon to M gold colour
    - pronounced intensity
    - bread dough, walnuts, ginger, green apple
    - dry, high acidity
    - high alcohol (13.5 - 15%), M body
    - very good to outstanding
    - premium to super-premium
  - oxidative Savagnin:
    - ~Vin Jaune but less intense and lower in alcohol

- thick-skinned variety
- thrives on Jura's steep slopes with marl
- Vin Jaune: min 5y under flor; can age for decades
- oxidative Savagnin: 2-3y under flor
- also in blends with Chardonnay

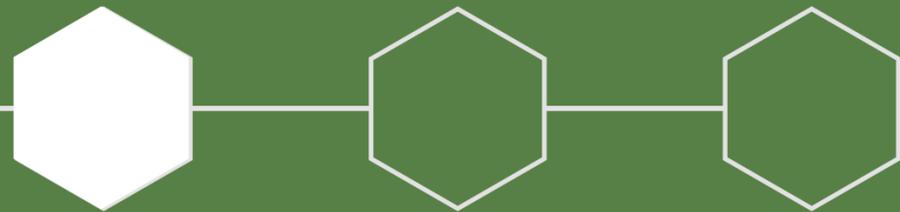




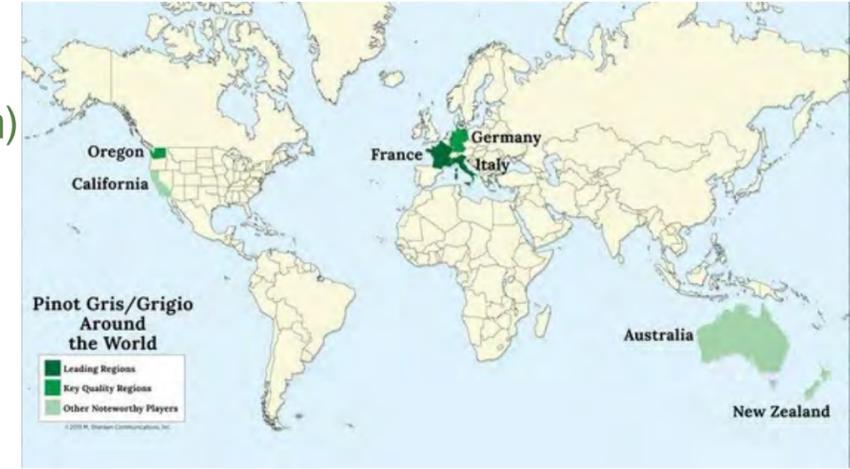
EARLY BUDDING

# PINOT GRIS / PINOT GRIGIO

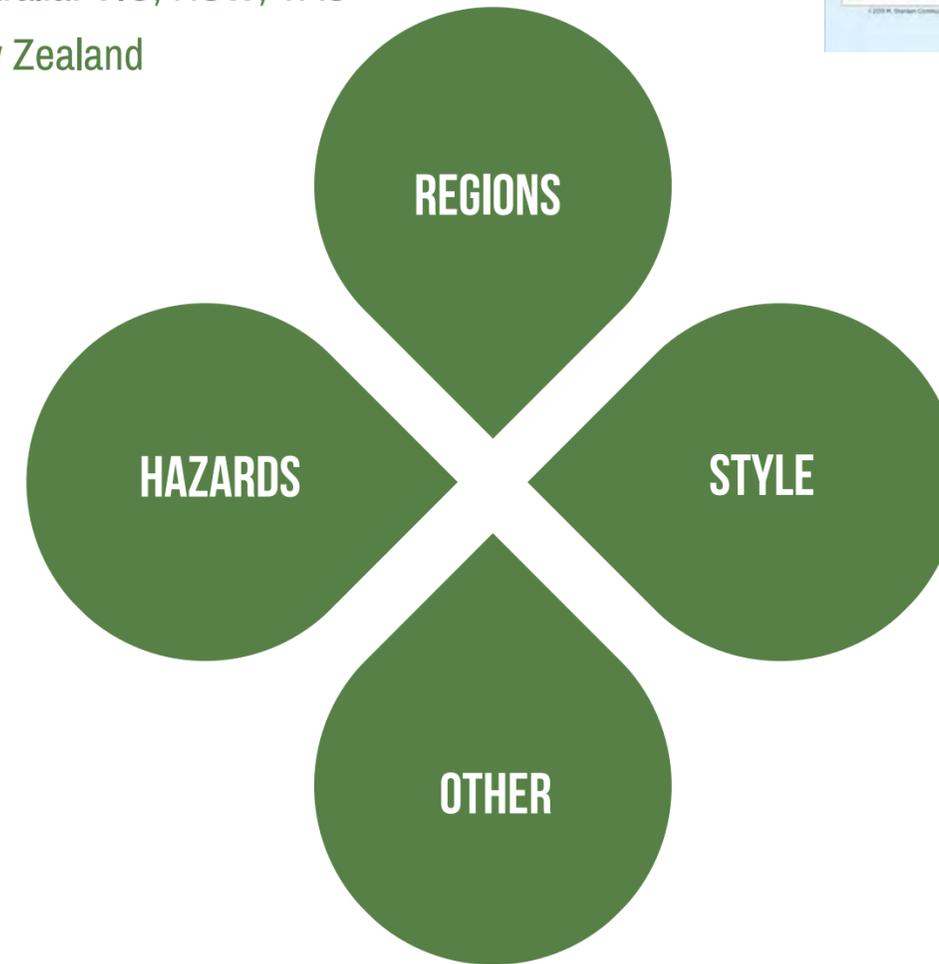
EARLY RIPENING



- Alsace, FR
- Germany: Grauburgunder (Rheinhessen, Pfalz, Baden)
- NE Italy: Trentino, Friuli, Veneto
- USA: California, Oregon, Finger Lakes
- British Columbia, CA
- Australia: VIC, NSW, TAS
- New Zealand



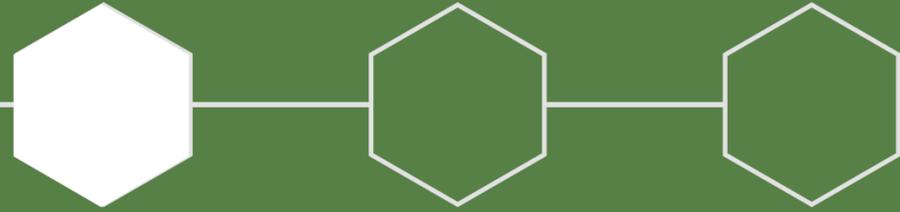
- spring frosts
- downy mildew
- botrytis bunch rot



- Alsace style:
  - M intensity peach, apple
  - full-bodied, M to high alcohol
  - M acidity
  - best:
    - rich, oily texture
    - age: honey, smoked
  - from dry to sweet
- Italian 'Pinot Grigio' style:
  - light to M- int. apple and lemon
  - light to M- body; M alcohol
  - dry, M+ acidity

- moderately yielding
- can rapidly accumulate sugar and drop acidity => picking dates!

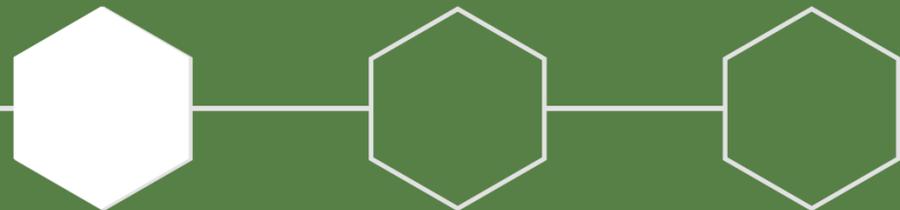




EARLY BUDDING

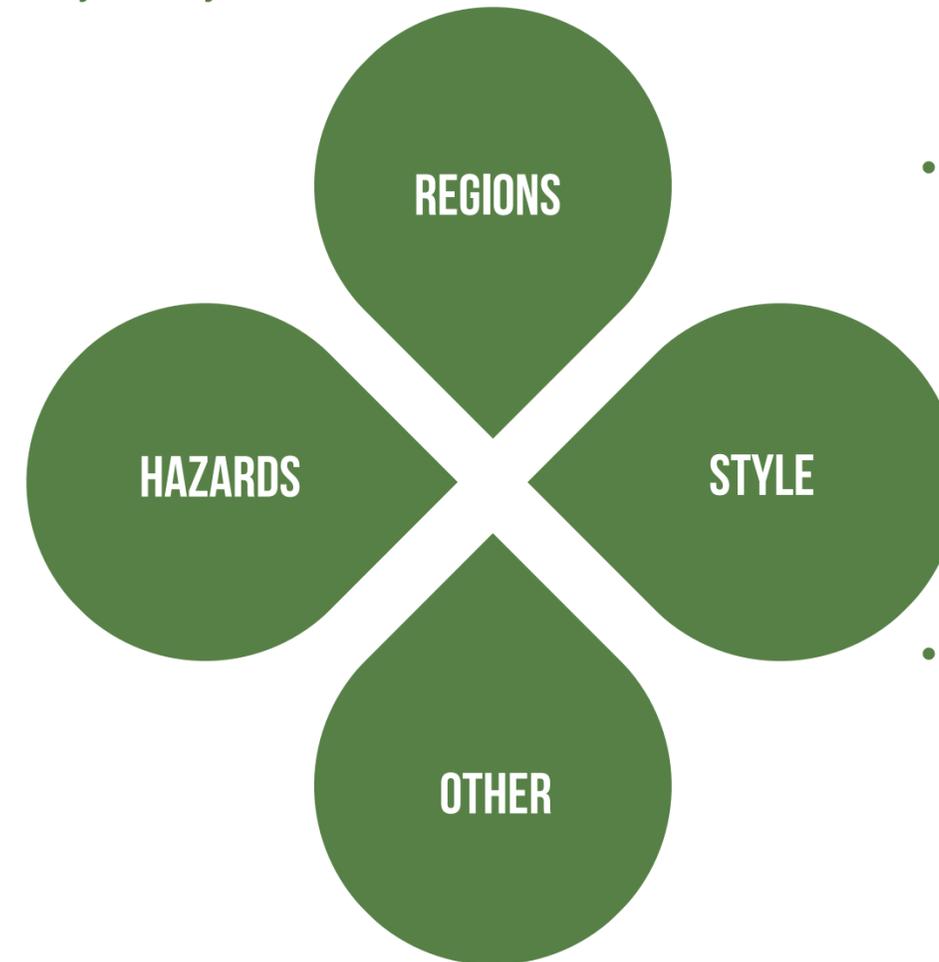
# PINOT BLANC

EARLY RIPENING



- France: Alsace
- Germany: especially Rheinhessen, Pfalz, Baden
- Austria
- Italy: Alto Adige, Friuli
- USA: California (North Coast: Anderson Valley AVA; Central Coast / Monterey County: Chalone AVA)

- spring frosts
- fungal diseases



- Alsace:
  - typically low intensity apple & peach
  - M acidity
  - M alcohol
  - acceptable to good, some very good
  - inexpensive to mid-priced
  - most frequently in blends or Crémant
- Germany: often very good Q
  - well balanced with M+ acidity
  - delicate citrus and stone fruit
  - some aged in oak

- likes deep, warm soils
- good cold resistance
- in Alsace: Auxerrois can be labelled Pinot Blanc, but different variety, be it of the same family
- in Germany: popularity increased significantly since 1990s, especially in Rheinhessen, Pfalz and Baden

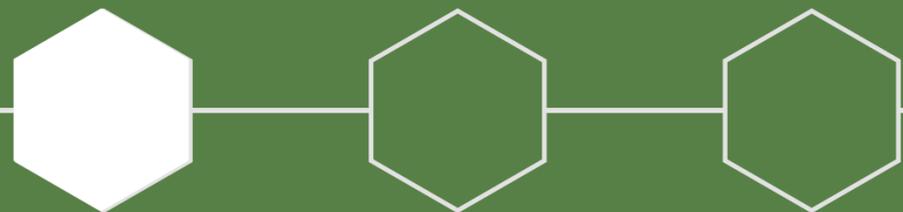




EARLY BUDDING

# SILVANER

EARLY RIPENING



- spring frosts
- fungal diseases
- chlorosis

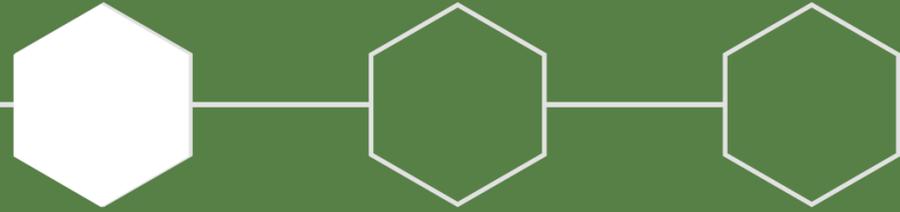
- Alsace: Sylvaner
- Germany: Silvaner
  - especially in Franken: higher quality



- large amounts of simple, inexpensive wines with subtle fruit aromas (from green to tropical fruit)
- e.g. Franken: lower yields
  - dry, M to M+ acidity
  - M body
  - distinctive earthy characteristic

- Germany: plantings nearly halved since 1980 but decline has now stabilised
- lower in acidity and less aromatic than Riesling

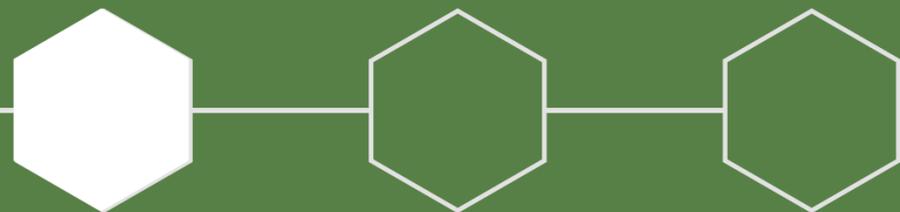




EARLY BUDDING

# GEWURZTRAMINER

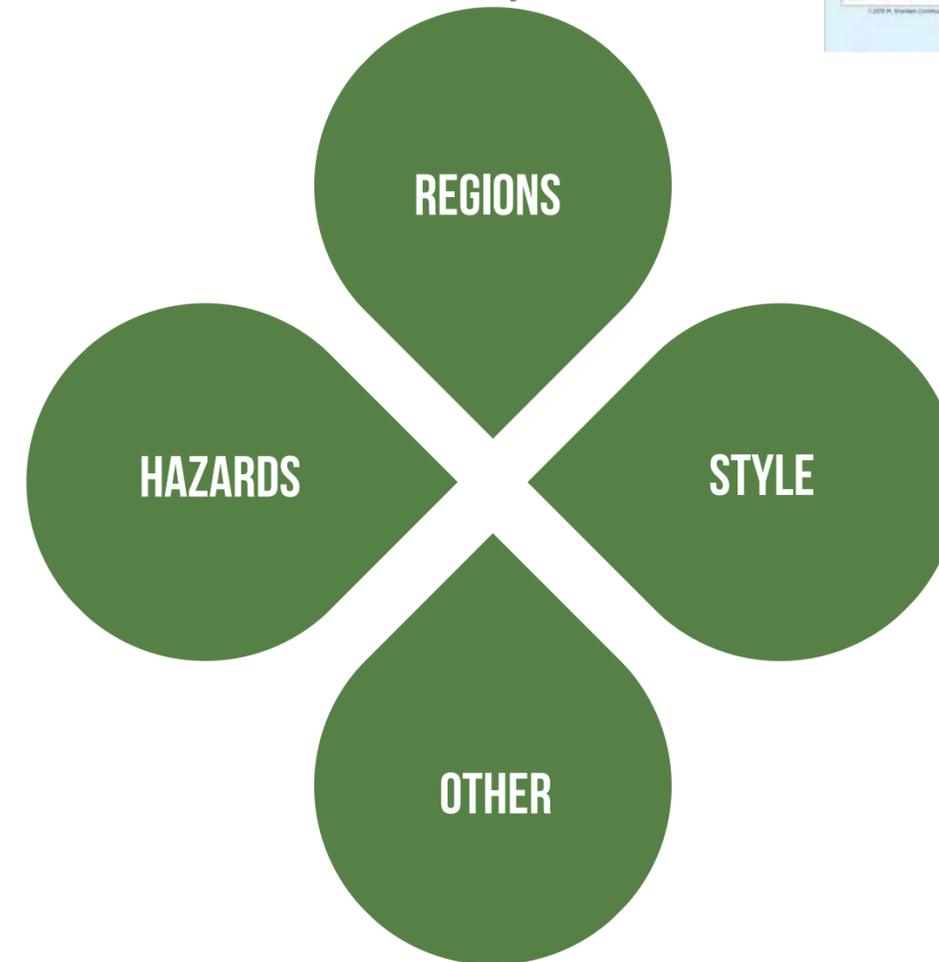
EARLY RIPENING



- Alsace, FR
- Trentino, IT
- Catalunya, ES
- USA: Lodi; Finger Lakes
- Ontario, CA (Icewine)
- Bío Bío Valley, CL



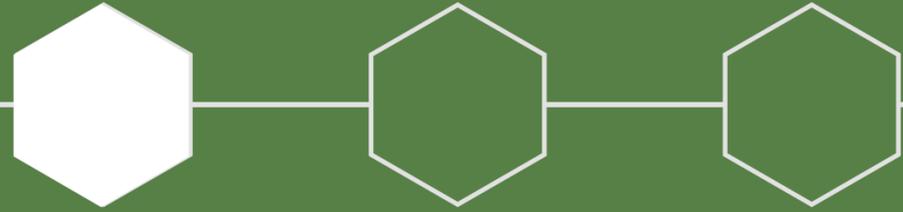
- spring frosts
- coulure
- chlorosis
- desiccation of stems
- Alsace:
  - powdery mildew
  - grapevine moth
  - grey rot



- M lemon colour
- pronounced intensity
- lychee, peach/apricot, rose, spice
- M to high alcohol
- M to full body
- low acidity
- range of styles, from dry to sweet
- good to outstanding
- mid-priced to premium

- rapidly accumulates sugars, but still picked late: fully ripe skins needed to maximise aromas and avoid unripe tannins
- vigorous variety -> canopy management
- moderately productive (coulure)

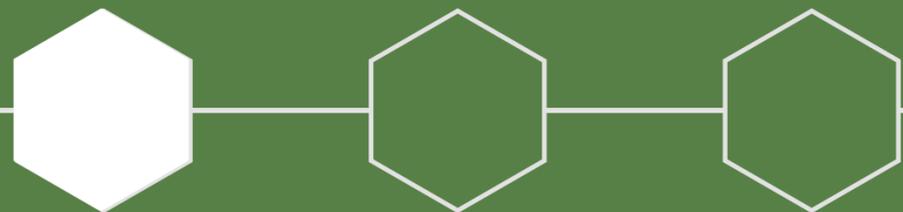




EARLY BUDDING

# MALAGOUSIA

EARLY RIPENING



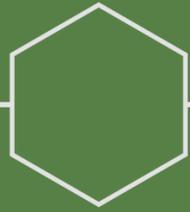
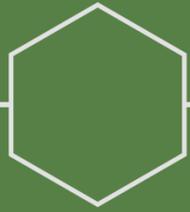
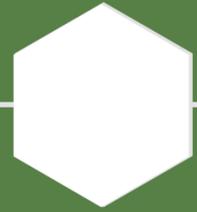
- Greece: small plantings but spreading rapidly
  - grown in most areas



- intense stone fruit & flowers
  - cooler sites: herbal/herbaceous
- M acidity
- M body
- wines fermented in stainless steel, old oak or proportion of new oak

- 20 years ago: almost extinct
- quickly established reputation for high-quality wine
- plantings still small but spreading

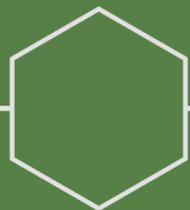
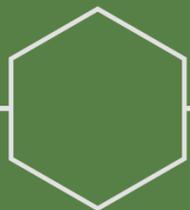
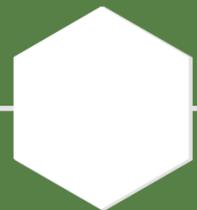




EARLY BUDDING

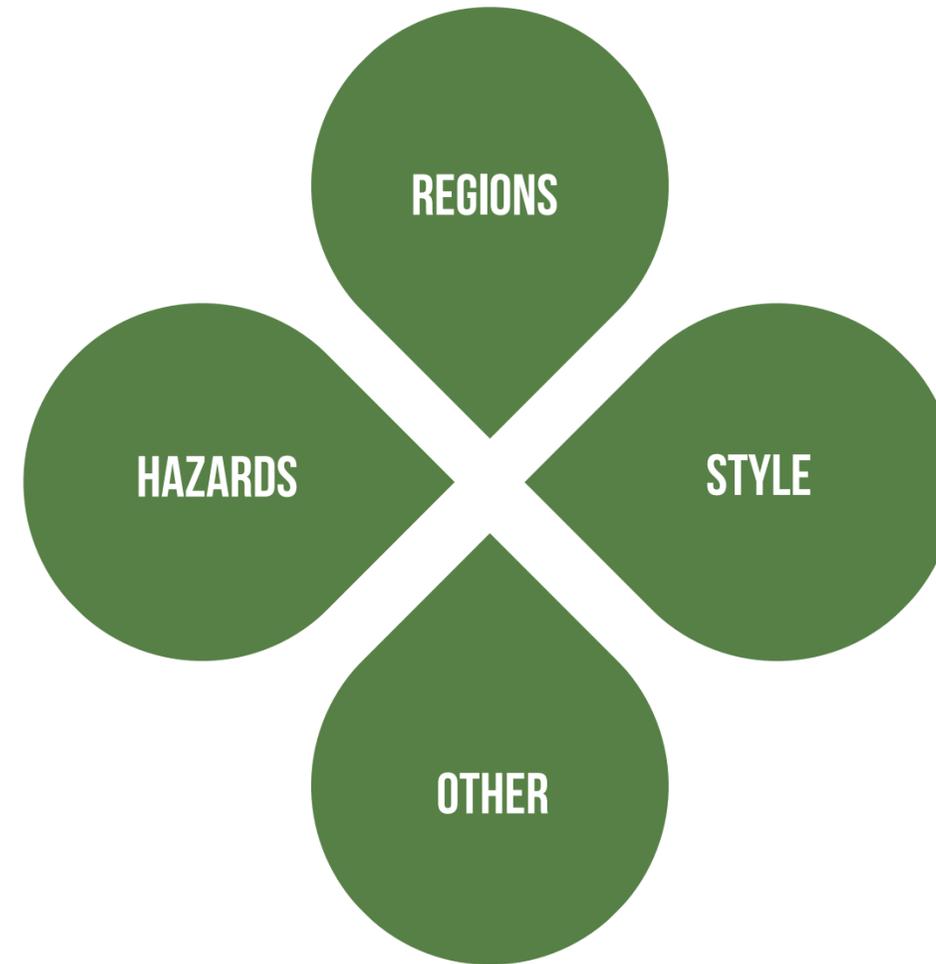
# INZOLIA / ANSONICA

EARLY RIPENING



- Sicily, IT

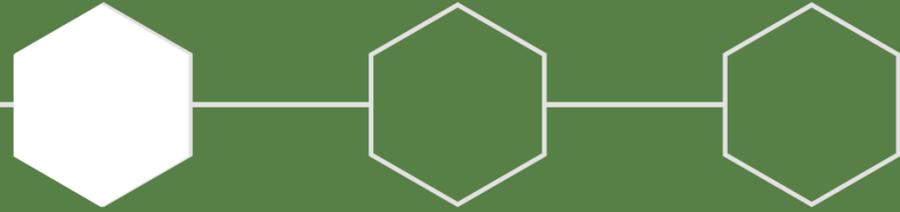
- good drought resistance



- M- intensity
- lemon fruit
- M acidity => useful blending partner for higher acidity Catarratto & Grillo
- M body
- acceptable to good
- inexpensive to mid-priced

- needs to be picked early to retain acidity

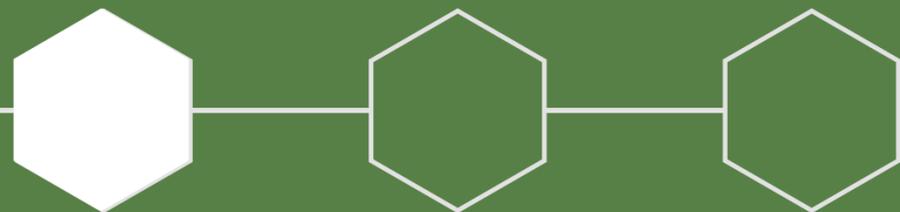




EARLY BUDDING

# GODELLO

EARLY RIPENING



- powdery mildew
- botrytis bunch rot

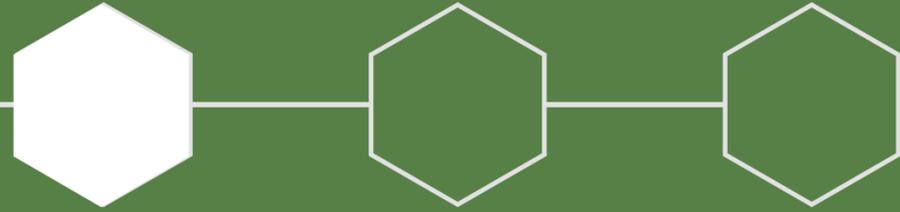
- ES:
  - Galicia: Valdeorras DO, Monterrei DO
  - Castilla y León: Bierzo DO
- PT: Douro: 'Gouveio': M+ acidity, citrus, stone fruit



- citrus and stone fruit
- sometimes herbal, wet stone
- M+ acidity
- premium: F and/or matured in oak => texture & toasty, spicy complexity

- berries can attain high sugar levels

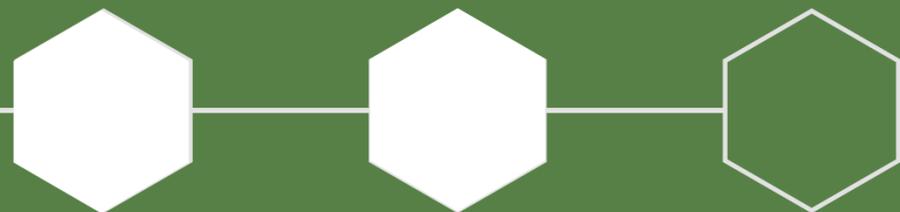




EARLY BUDDING

# MELON

EARLY TO MID RIPENING



- quite hardy variety
- spring frosts
- good resistance: powdery mildew
- tight bunches => prone to downy mildew and botrytis bunch rot

- Loire, FR:
  - Muscadet AOC
  - Muscadet Sèvre et Maine AOC
  - Muscadet Coteaux de la Loire AOC
  - Muscadet Côtes de Grandlieu AOC



- high acidity
- light body, low to M alcohol
- light intensity green apple
- neutral base wine, MLF avoided, often 'sur lie' ageing



Lime



Seashell



Green Apple

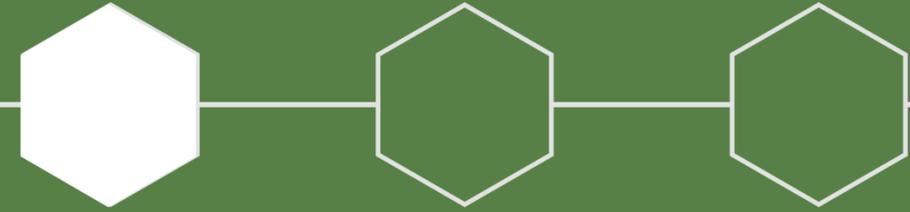


Pear



Bread Dough

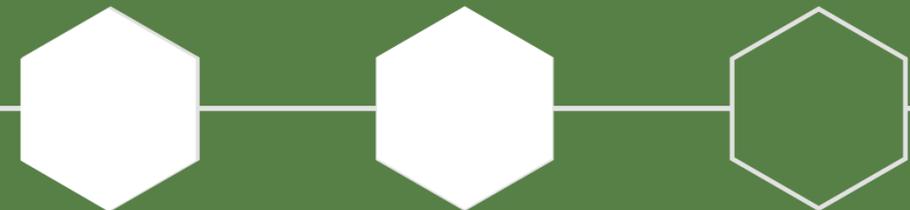
- can produce high yields
- timely and repeated spraying necessary in humid climate (tight bunches)



EARLY BUDDING

# FRIULANO / SAUVIGNON VERT / SAUVIGNONASSE

EARLY TO MID RIPENING



- Friuli, IT

- good disease resistance



- formerly known as Tocai Friulano

- M- intensity
- floral and apple flavours
- M+ acidity
- M to high alcohol
- most common: stainless steel
- some: lightly oaked
- best: capacity to age
- good to very good quality
- mid to premium priced



Grapefruit



Green Pear



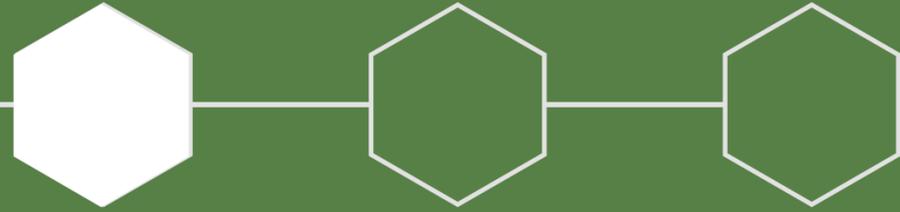
White Peach



Tarragon



Crushed Gravel



EARLY BUDDING

# VIOGNIER

MID RIPENING



- FR: N. Rhône, IGP Pays d'Oc
- IT: Sicilia DOC
- Portugal
- USA (California, Washington State), Canada, Chile, Argentina, South Africa, Australia, New Zealand



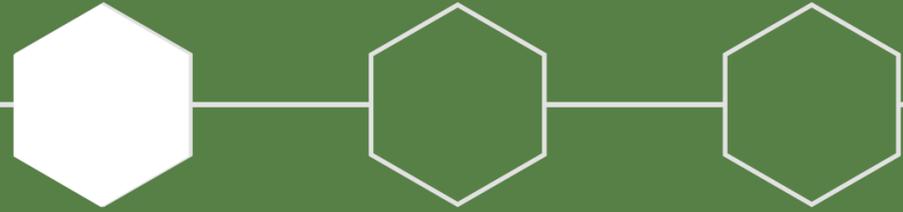
- spring frosts
- poor flowering and fruit set (coulture)



- M lemon colour
- pronounced intensity
- honeysuckle, apricot, peach
- M to high alcohol
- low acidity
- up to 20% allowed in some N. Rhône red Syrah wines

- N Rhône: normally grown on trellis -> avoid wind damage
- yields: low and unpredictable
- difficult to balance -> picking dates!
  - fruit needs to be very ripe to have its typical pronounced aromas
  - if left too long: loses flavour & acidity + gains sugar quickly





EARLY BUDDING

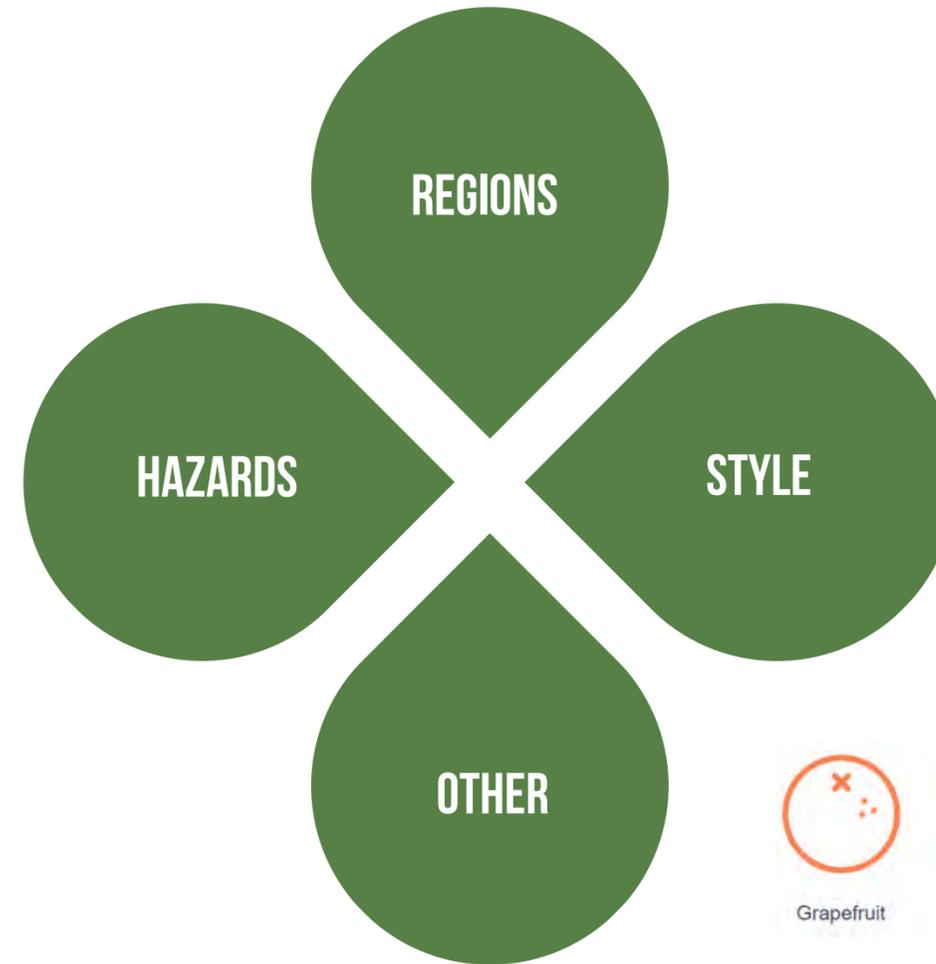
# GRILLO

MID RIPENING



- Sicily, IT

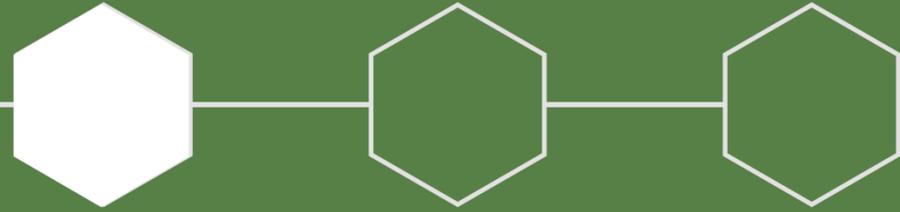
- heat resistant
- good disease resistance



- M intensity
- lemon and floral notes
- high acidity
- full-bodied
- M alcohol
- good to very good
- inexpensive to mid-priced
- rare oak-aged example, premium (by Marco de Bartoli)



- natural cross between Catarratto and Moscato
- moderately high yielding
- heat resistant => well suited for Sicily's warm, dry climate
- careful not to over-expose the bunches -> aroma loss
- must oxidises easily => protective winemaking techniques



EARLY BUDDING

# VERMENTINO / ROLLE

MID RIPENING



- Southern France (i.a. Provence): 'Rolle'
- IT: Tuscany; Sardinia
  - Vermentino di Sardegna DOC -> high yields allowed (112 hL/ha)
  - Vermentino di Gallura DOCG (only DOCG in Sardinia): 63 hL/ha
- SE Australia)

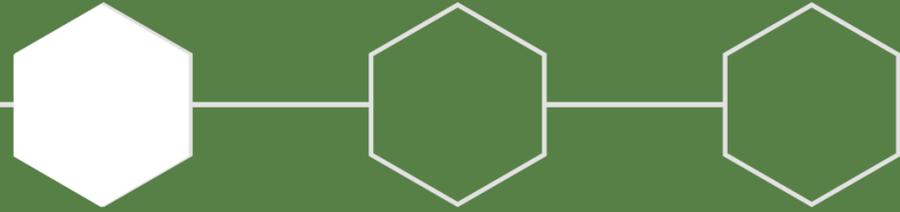
- spring frosts
- downy mildew
- European grapevine moth



- M intensity
- lemon, acacia, if riper: tropical fruit
- M+ acidity
- light to M body
- M alcohol
- usually stainless steel
  - most: short lees ageing
  - some: 6 months on lees: fuller body
- good to very good
- mid to premium priced

- best on sunny, exposed sites with poor soils

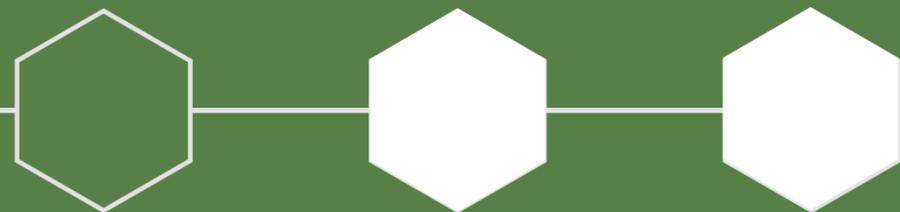




EARLY BUDDING

# GROS & PETIT MANSENG

MID TO LATE RIPENING



- South West France: Jurançon AOCs  
+ IGP Côtes de Gascogne

- spring frosts
- resistant to botrytis bunch rot  
(thick skins)



- Petit Manseng:
  - moderately aromatic
  - retains high acidity
  - high alcohol
- Gros Manseng: less aromatic concentration and intensity
  - mainly for dry wines



Peach

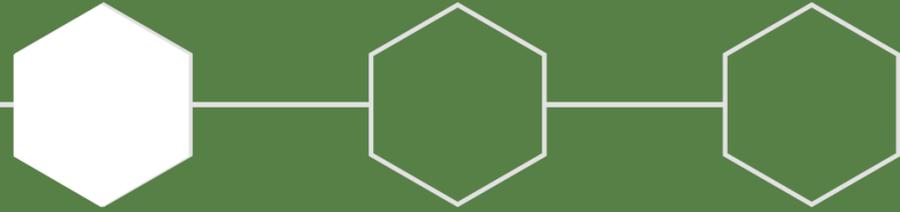


Exotic fruits



Grapefruit

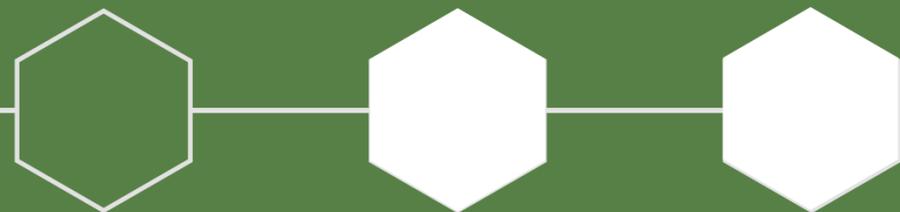
- thick skins => resistant to botrytis bunch rot => suitable for late harvesting
- Petit Manseng:
  - moderately aromatic
  - retains high acidity => suitable for balanced sweet wines
  - accumulates sugar rapidly => picking dates to balance full flavour ripeness, acidity and potential alcohol
- Gros Manseng: higher yields -> less aromatic concentration and flavour intensity



EARLY BUDDING

# FALANGHINA

MID TO LATE RIPENING



- good disease resistance
- fruit can shrivel at end of season => correct harvest date
- autumn rain

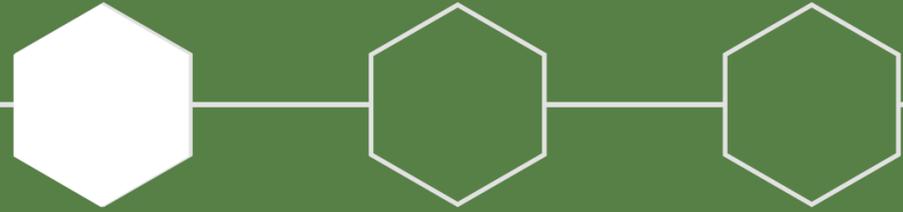
- Campania, IT (most planted white variety)
  - largest DOC with Falanghina: Falanghina del Sannio DOC
  - lower alcohol (12-13%): Campi Flegrei Falanghina DOC



- M intensity
- apple and white peach
- herbaceous notes (grass)
- M+ acidity
- almost all unoaked
- acceptable to very good
- inexpensive to mid-priced

- long considered just a workhorse variety
- since 1980s: increase in popularity, especially in hospitality sector

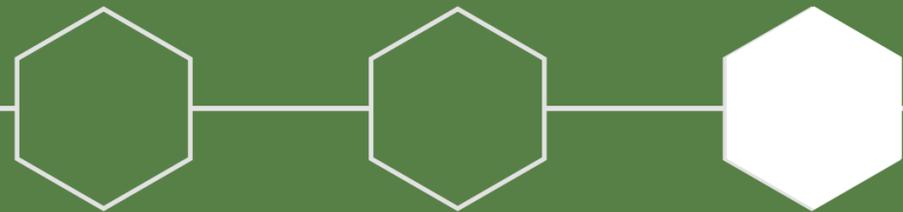




EARLY BUDDING

# CHENIN BLANC

LATE RIPENING



- Loire, FR
- South Africa
- Argentina
- California (i.a. Central Valley, Sierra Foothills)



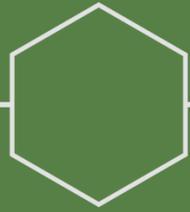
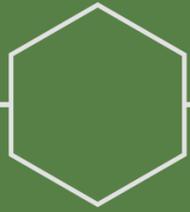
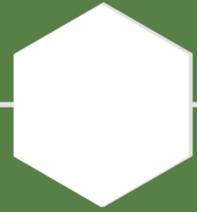
- spring frosts
- powdery mildew
- botrytis bunch rot
- trunk diseases
- autumn rains
- ripens unevenly



- range of styles: SpW, dry, off-dry & sweet
- Loire: M intensity green apple & lemon, sometimes steely/smoky
- SA: M to pron. ripe apple, peach & tropical fruit, can be oaked
- high acidity
- often some RS => off-dry
- M to full body
- M alcohol

- susceptible to noble rot
- vigorous => if allowed: high Y
- ripens unevenly
- => for best Q: picking in several passes

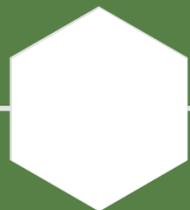
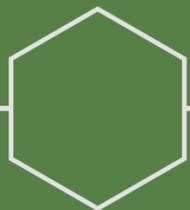
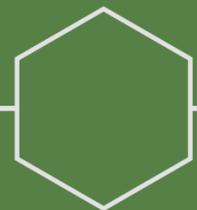




EARLY BUDDING

# FURMINT

LATE RIPENING



- Tokaj, HU (69% of plantings)

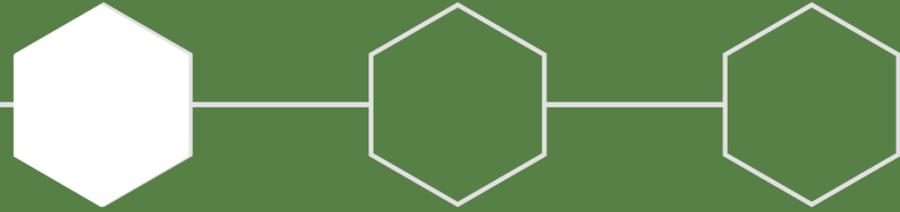
- particularly susceptible to botrytis



- dry wines in range of styles
  - early drinking
  - ageworthy, often oak aged
  - can be full-bodied, high alcohol
  - lemon, apple, pear
  - with age: honey, nuts
- vital component in Aszú wines
  - with botrytis: dried apricot, mango

- versatile grape: high-quality wines from dry to sweet
- needs Tokaj's long, sunny growing season to ripen fully
- retains high acidity even when fully ripe
- thick-skinned but particularly susceptible to botrytis
- grapes naturally accumulate high levels of sugar

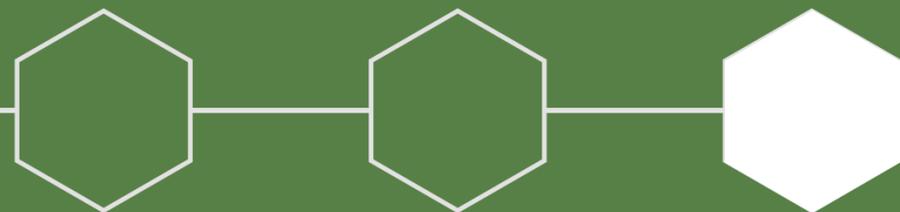




EARLY BUDDING

# GRECO

LATE RIPENING



- Campania, IT
  - Greco di Tufo DOCG:
    - small but densely planted
    - limestone/clay -> good drainage & water retention

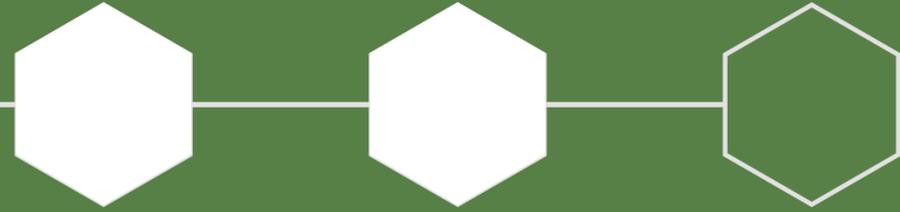
- powdery mildew
- downy mildew
- grey rot



- deep lemon colour
- floral, stone fruit, smoky notes, sometimes tropical
- high in alcohol, oily texture
- most unoaked
- best: potential for ageing
- very good, some outstanding
- mid-priced to premium

- challenging to grow: low vigour, low productivity, prone to fungal diseases
- but: heat and drought tolerant
- needs long season to develop depth of flavour





EARLY TO MID BUDDING

# VERDEJO

EARLY TO MID RIPENING



- ES: Rueda, Toro, Rioja

- relatively drought tolerant



- able to withstand the hot, dry summers and overall low rainfall of Rueda
- if DO Rueda wines have min. 85% Verdejo, can be labelled DO Rueda-Verdejo

- apple, pear, peach
- often a herbal note (fennel)
- often slight bitterness on finish
- M to M+ acidity
- M alcohol
- sometimes blended with Sauvignon Blanc (Rueda) or Viura (Rioja)

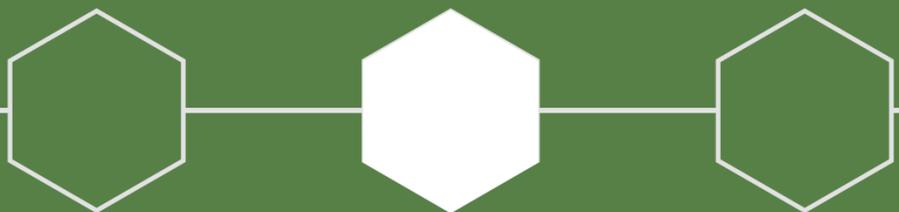




EARLY TO MID BUDDING

# GRENACHE BLANC

MID RIPENING



- mainly in S. Rhône
- South of France, e.g. IGP Pays d'Oc, Corbières AOC, La Clape AOC
- Spain / Catalunya: Priorat, Montsant, Costers del Segre
- South Africa (Swartland)

- good wind resistance



- dry white blends and some VDN
- contributes:
  - low intensity ripe green fruit
  - some floral notes
  - high alcohol
  - low acidity



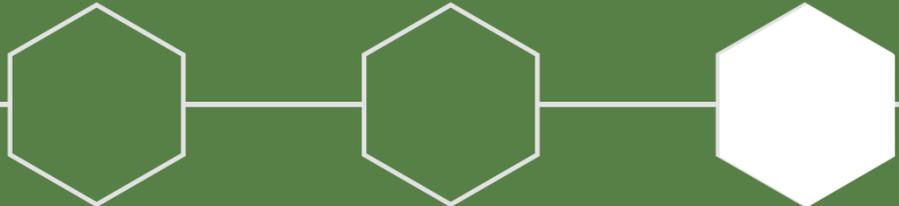
- tendency to reach high alcohol levels => well suited for VDNs



EARLY TO MID BUDDING

# FIANO

LATE RIPENING



- powdery mildew
- downy mildew
- resistant to botrytis (thick skins)

- Campania, IT
  - Fiano di Avellino DOCG



- M- to M intensity
- floral, peach, hazelnut
- M to M+ acidity
- M+ body, waxy texture
- sandy soils (fast drainage):
  - lighter, fruitier wines
- clay-dominated soils (H2O retention):
  - weightier wines
- very good to outstanding
- mid-priced to premium
- best wines: can age 8 - 10 years



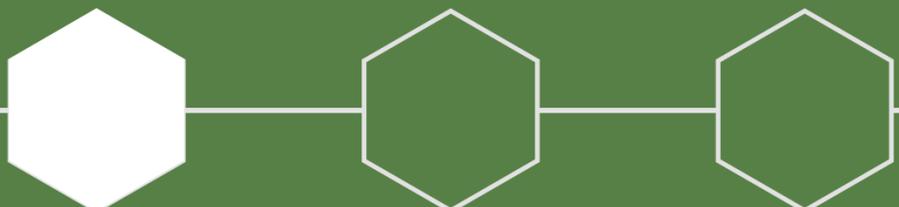
- potentially high-quality variety, held in very high regard
- rescued from neglect by Mastroberardino family after WWII
- harvested mid to late October but can resist botrytis due to thick skins



MID BUDDING

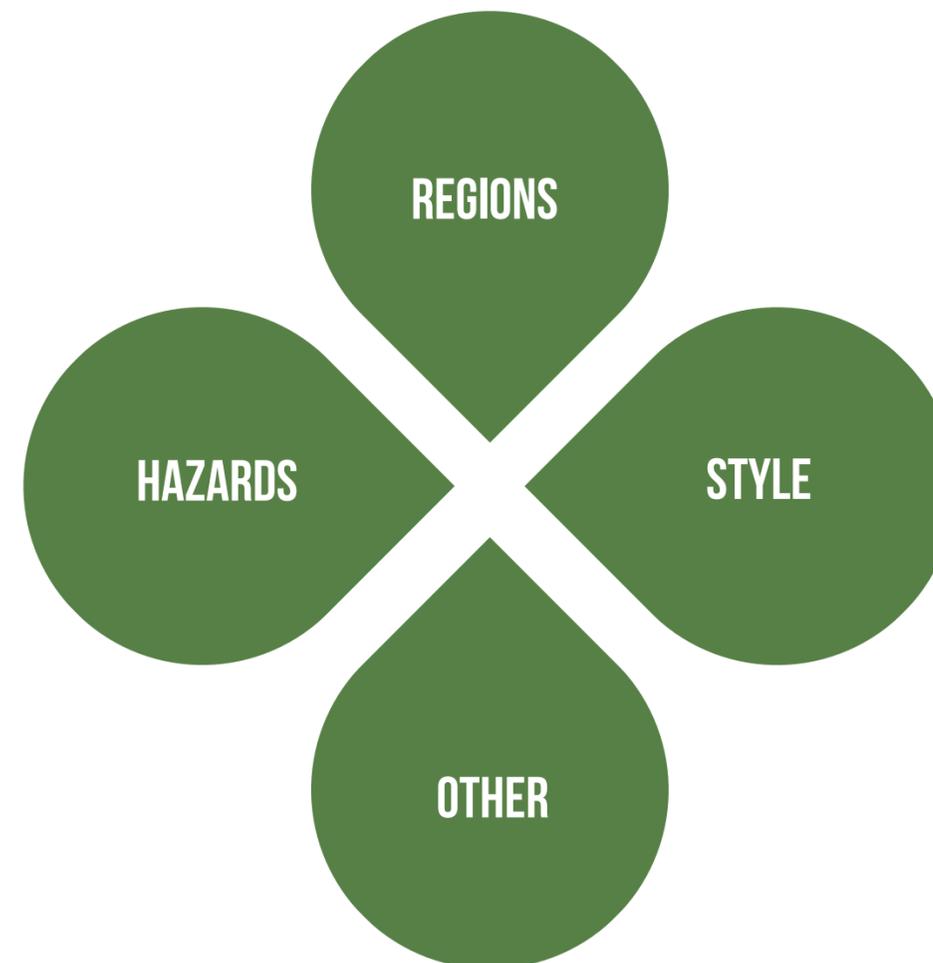
# MÜLLER-THURGAU

EARLY RIPENING



- powdery & downy mildew
- botrytis bunch rot (thin-skinned)

- Germany
- North-East Italy:
  - 3rd most planted grape in Trentino (10%)
  - Alto Adige (Basso Atesina)



- M acidity
- attractive but relatively simple floral and fruity aromas
- less structure and character than Riesling -> for early drinking

- a.k.a. Rivaner
- one of the earliest German crosses
- can produce high yields in most conditions
- thin-skinned => susceptible to fungal diseases
- most planted variety in DE in 1970s-80s (Liebfraumilch)
- plantings more than halved since

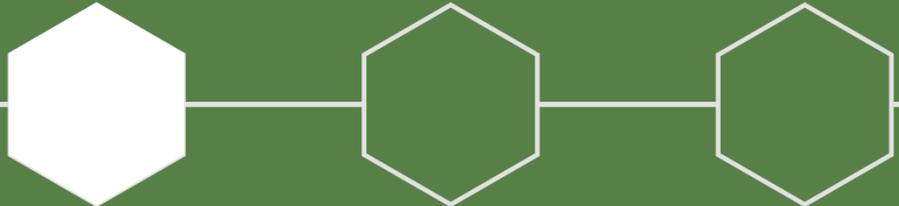




MID BUDDING

# PECORINO

EARLY RIPENING



- high disease resistance

- IT: Marche
  - Marche IGT
  - Offida Pecorino DOCG
- IT: Abruzzo



- herbal notes (sage, thyme, mint)
- crisp apple and pear fruit
- high acidity
- high alcohol (14.5%)
- M body

- sterile buds near trunk => best trained long:
  - Guyot
  - pergola
- can be vinified before other local varieties -> frees up space in winery

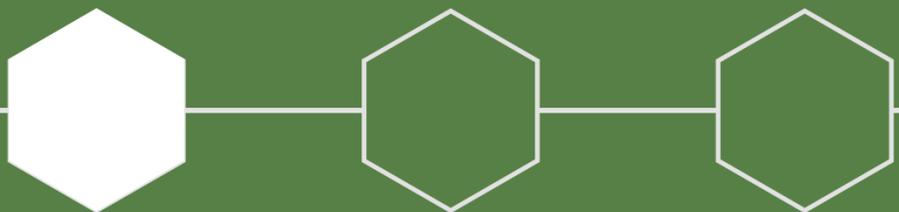




MID BUDDING

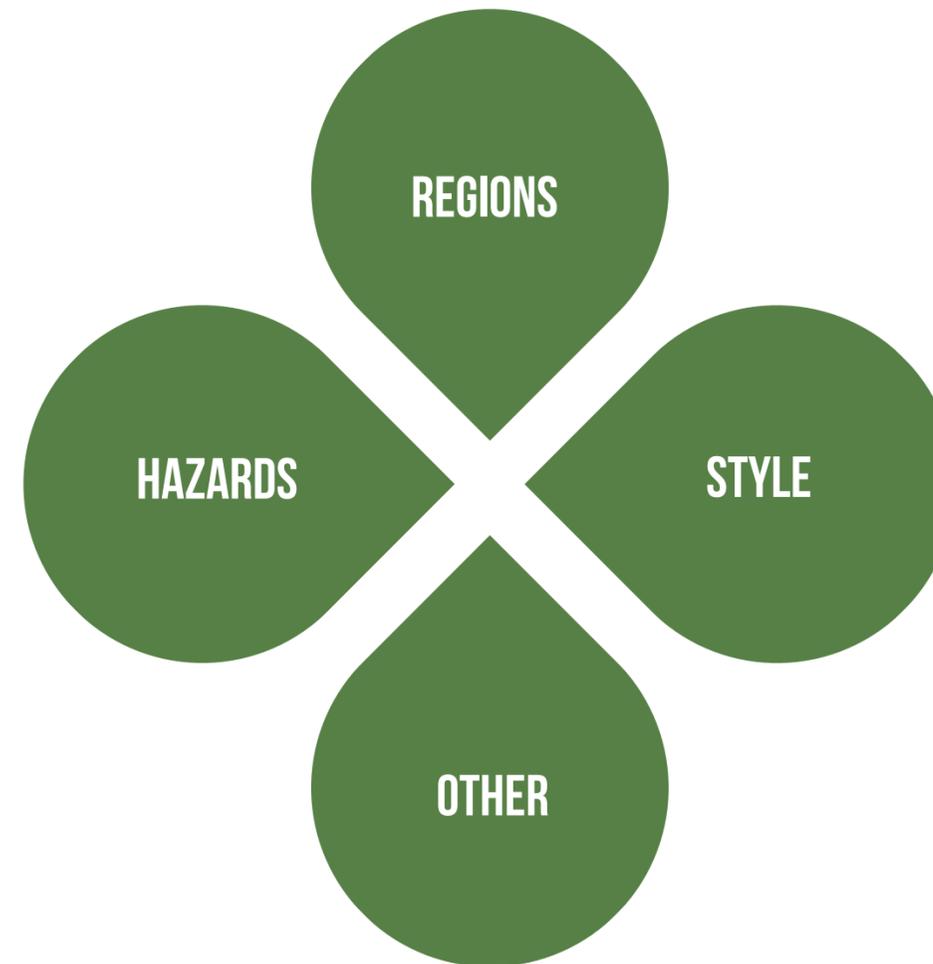
# TORRONTÉS

EARLY RIPENING



- downy mildew
- botrytis bunch rot

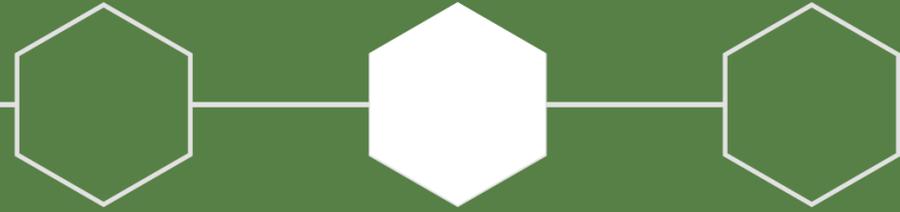
- Argentina:
  - widely planted in Mendoza, San Juan and La Rioja
  - particularly successful in Cafayate (Salta)
  - also: cooler, higher vyds, esp. in Uco Valley



- strong, floral aroma ~ Muscat
- modern: fruitier: lemon, grapefruit, peach -> fresher, lower alcohol
- <-> overtly floral, higher alcohol
- most: to drink young
- some: part fermented in oak -> blend with unoaked => more ageworthy wines
- some blends with e.g. Sauv. Blanc

- 3 different varieties:
  - **Torrontés Riojano**: best of the 3
    - Argentina's 2nd most planted white
  - Torrontés Sanjuanino
  - Torrontés Mendocino
- vigorous, high-yielding

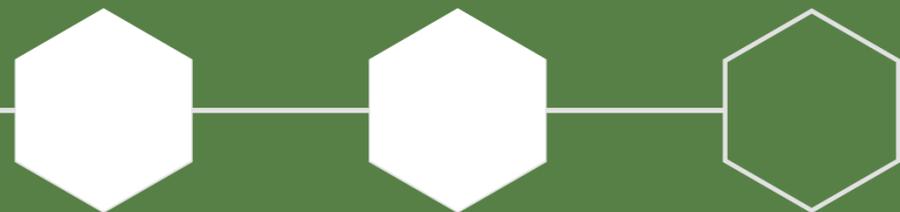




MID BUDDING

# CORTESE

EARLY TO MID RIPENING



- Piemonte, IT:
  - Gavi / Cortese di Gavi DOCG

- grey rot



- most for early drinking:
  - light intensity
  - lemon, apple/pear, white flowers
  - high acidity
  - M body
  - good quality, some very good
  - inexpensive to mid-priced
- some:
  - pre-F maceration for more intensity
  - bottle aged for tertiary notes
  - premium priced

- high-yielding variety
- thin-skinned
- must fermented at mid-range t°





MID BUDDING

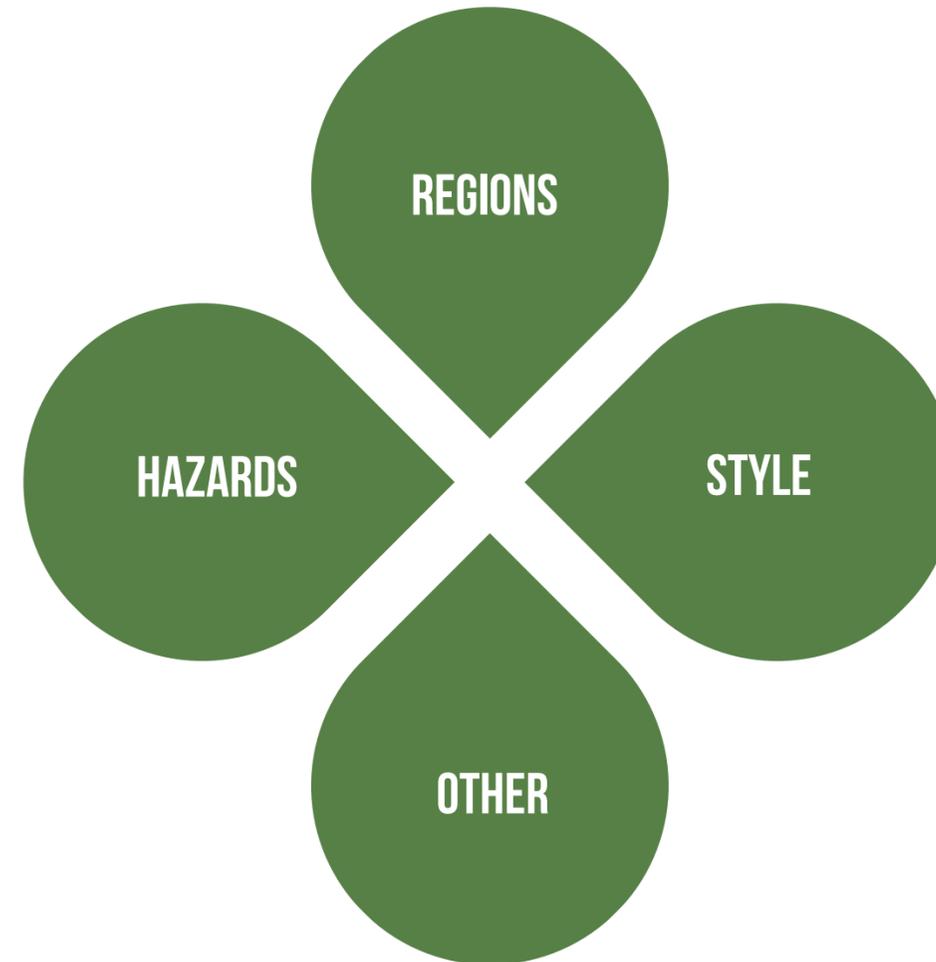
# ARNEIS

EARLY TO MID RIPENING



- Piemonte, IT:
  - Roero area: Roero Arneis DOCG
  - Langhe area

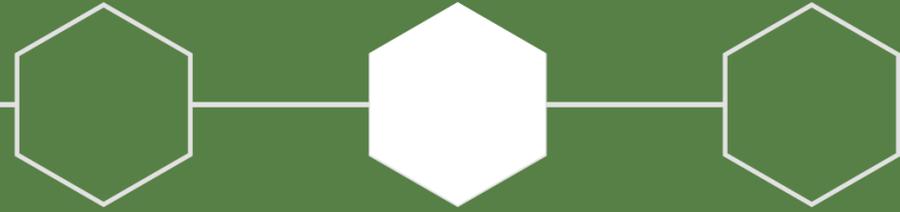
- powdery mildew



- complex but light intensity
- white flowers, chamomile, white peach, lemon
- M- acidity
- typically good, some very good
- inexpensive to mid-priced, some premium

- acidity drops very rapidly -> picking as soon as desired ripeness is reached
- oxidises easily -> minimise O2 contact in winery





MID BUDDING

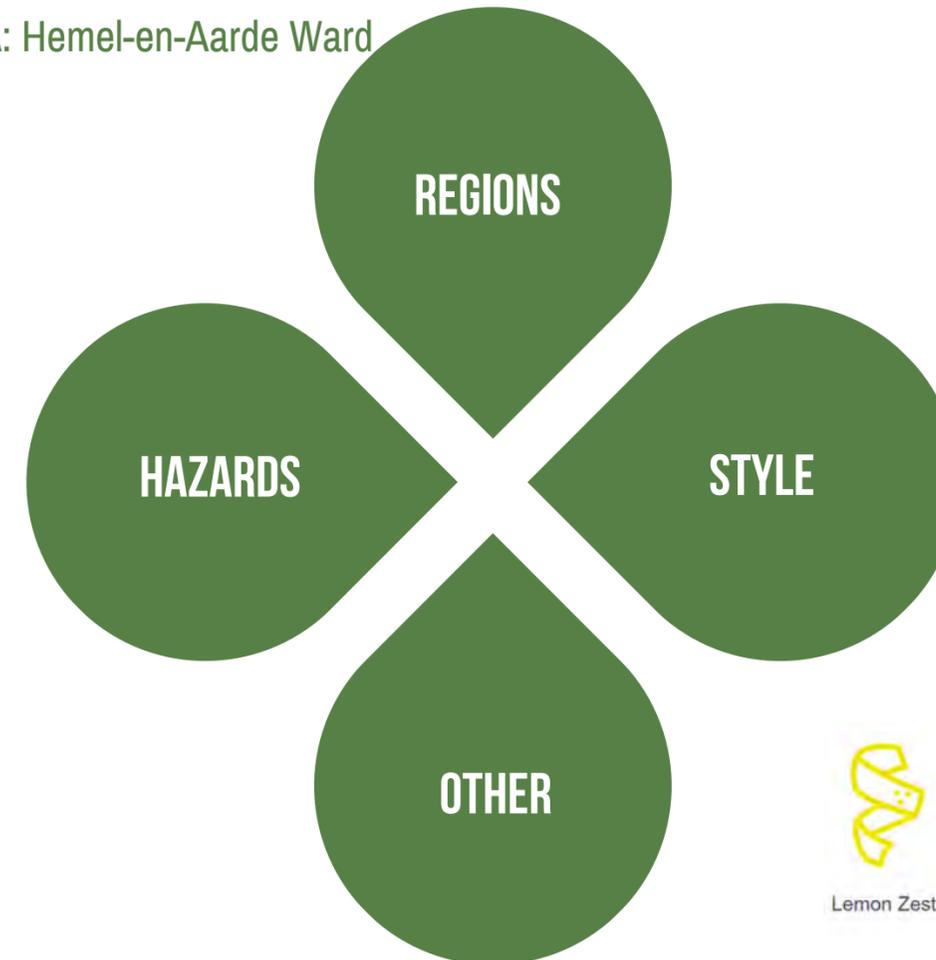
# ALBARIÑO / ALVARINHO

EARLY TO MID RIPENING

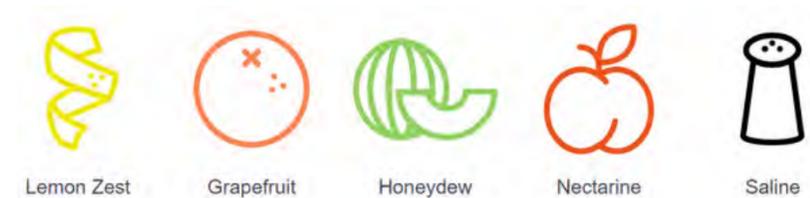


- Rias Baixas, Galicia, ES (> 95% of wine production: from Albariño grape)
  - usually single varietal; sometimes blended with:
    - Loureira: early-ripening, M+ acidity, citrus/floral/herbal
    - Treixadura: mid-ripening, low acidity, apple/peach
    - Caiño Blanco: late-ripening, high acidity, citrus
- PT: Vinho Verde. USA: California (Edna Valley AVA), Lodi AVA
- SA: Hemel-en-Aarde Ward

- less prone to rot (thick skins)  
=> well suited to damp climates



- flavours of apple, peach, lemon, grapefruit, melon, sometimes floral
- high acidity
- M- to M body
- M alcohol



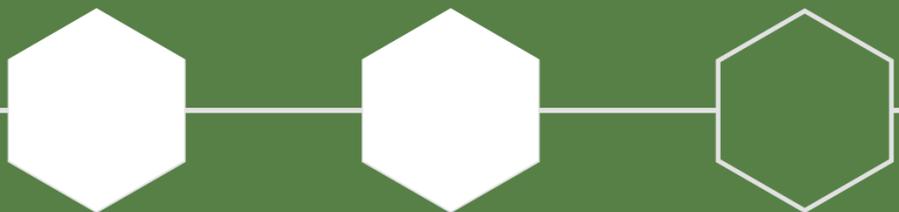
- warming climate + improved viticulture  
=> can ripen fully in most years
- 5 non-contiguous sub-zones:
  - Val do Salnés
  - O Rosal
  - Condado do Tea
  - Ribeira do Ulla
  - Soutomaior



MID BUDDING

# ENCRUZADO

EARLY TO MID RIPENING



- PT: Dão



- M to M+ acidity
- lemon, peach, sometimes floral
- can be full-bodied
- either fermented in neutral vessels -> retain fruit flavours
- or fermented & matured in oak
  - sometimes lees ageing/stirring
  - for additional texture
  - age well in bottle -> can develop nutty characters
- good to very good, a few outstanding
- mid to premium priced

- key white grape variety in Dão for high-quality wines
- vigorous variety
- can be blended with other regional varieties: Malvasia Fina (= Boal in Madeira), Bical, Cercial

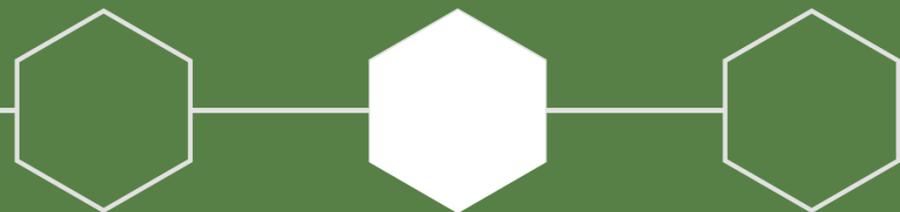




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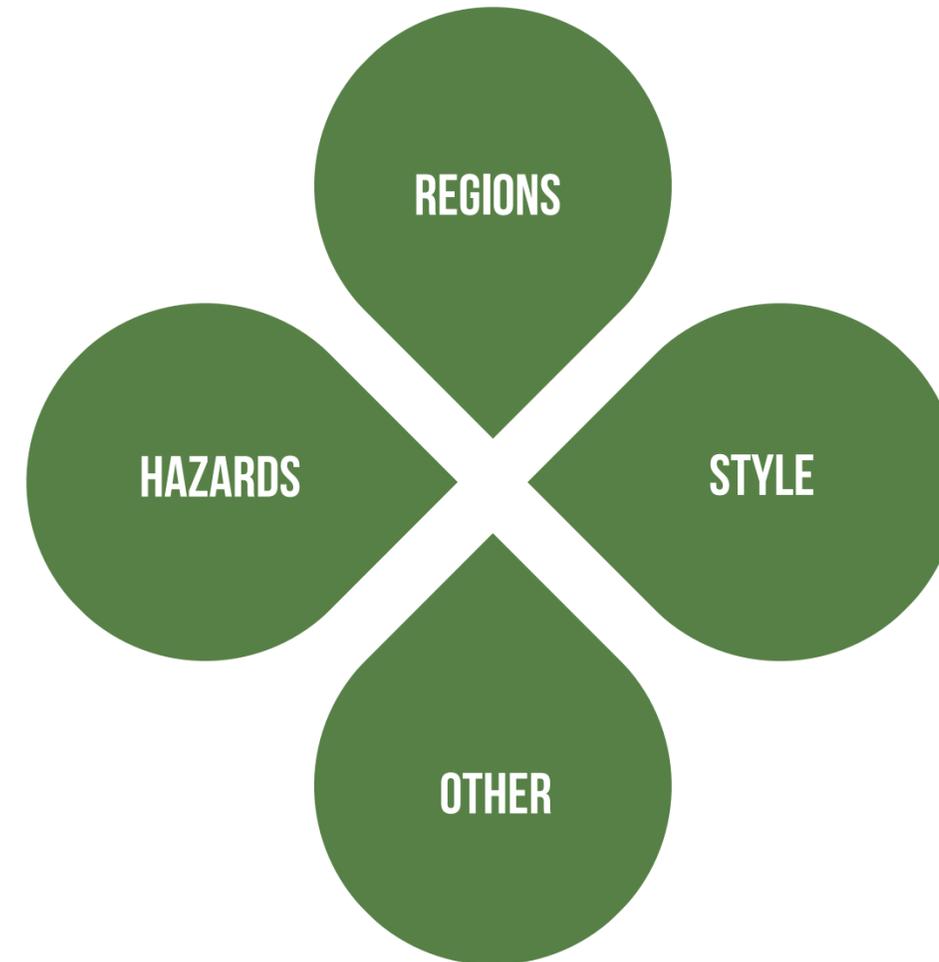
# SEMILLON

MID RIPENING



- FR: Bordeaux
- USA: California, Washington State
- South Africa: i.a. old vines in Franschhoek
- AUS: Hunter Valley, Riverina, Margaret River (blends with SB)
- New Zealand (also noble rot)

- botrytis bunch rot (& noble rot!)



- low to M intensity
- apple, lemon
- if under-ripe: grassy
- M to M+ acidity
- M body
- M alcohol
- strong affinity with new French oak (vanilla & spice)
- in botrytis sweet wines: pronounced honey & dried lemon/peach, waxy texture

- thin-skinned
- can carry high yields
- in dry white Bdx blends: softens SB
- more susceptible to botrytis than SB => high proportion in top Sauternes blend
- ageability -> toast & honey notes

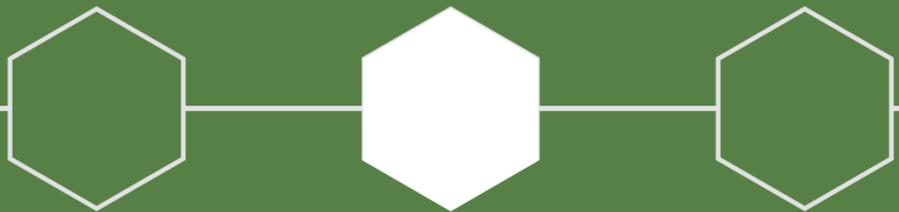




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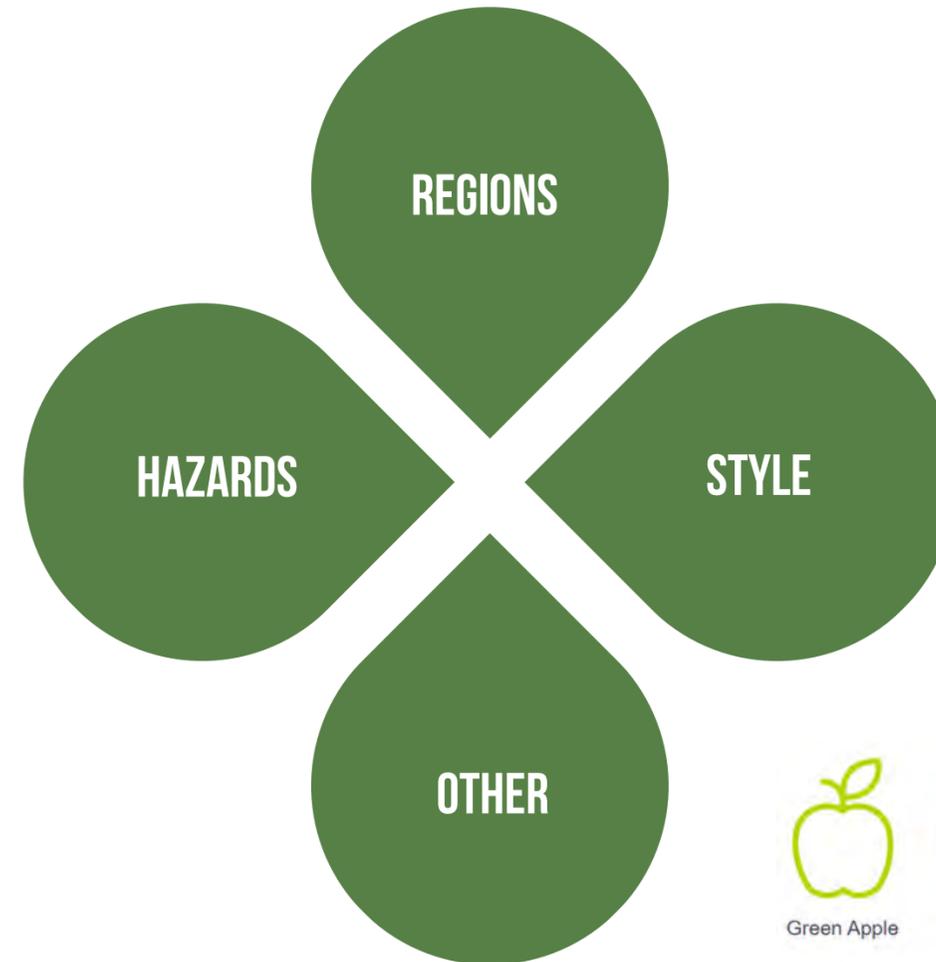
# (FRENCH) COLOMBARD

MID RIPENING



- FR, South West: IGP wines, e.g. Côtes de Gascogne IGP
- USA: California (Central Valley): 'French Colombard'
- South Africa, e.g. Robertson District (Breede River Valley)
- AUS: Riverland, Murray-Darling, Riverina

- powdery mildew
- botrytis bunch rot



- component in dry base wines distilled into brandy: cognac & armagnac (FR), South Africa
- M to M+ acidity
- fairly neutral white wines
- usually blended (e.g. with Sauvignon Blanc, Chardonnay, Chenin Blanc, Ugni Blanc, ...)



Green Apple



Honeydew



White Peach



Lemongrass



Almond

- vigorous and productive -> high-volume production
- rather neutral grape variety
- often used as cheap blending partner with more expensive varieties (e.g. Chenin Blanc, Chardonnay)
- California: rarely named on label, usually in inexpensive wines labelled 'dry white' or 'fruity white'



MID BUDDING

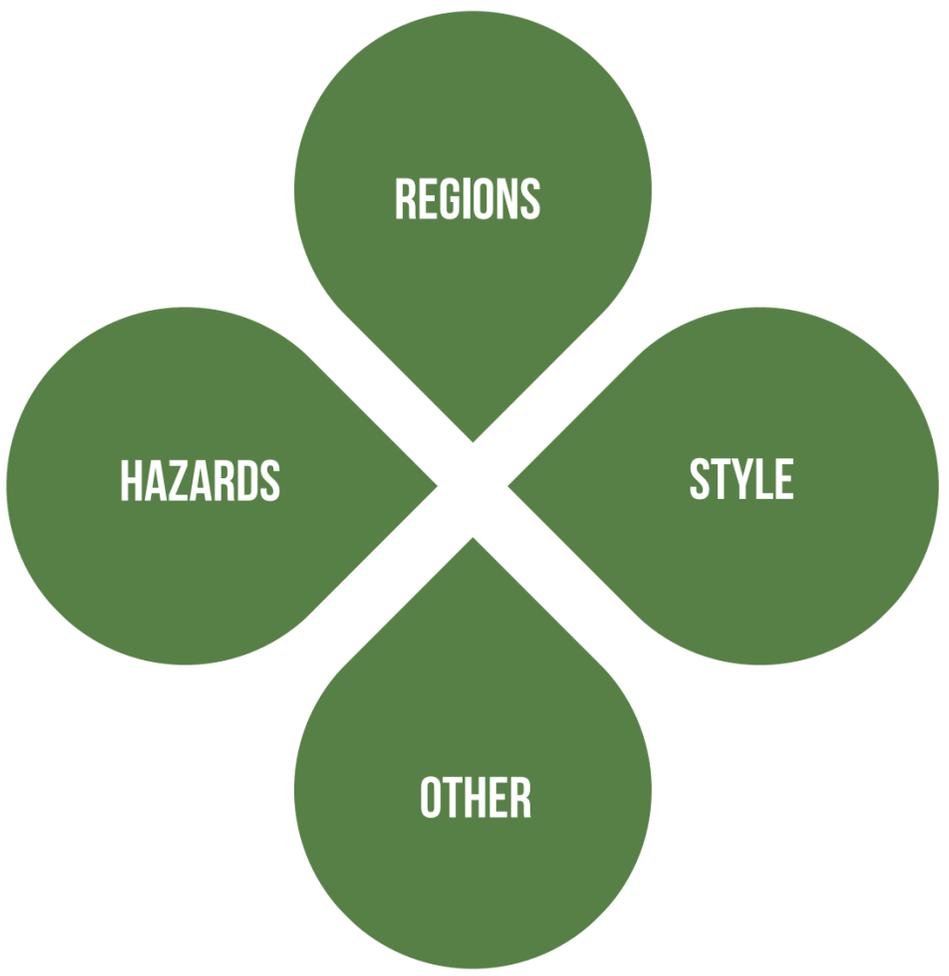
# GRECHETTO

MID RIPENING



- Umbria, IT
  - Grechetto di Orvieto

- resistant to fungal diseases -> suitable for late harvesting



- low to M intensity
- lemon and white flowers
- high acidity
- M body

- thick-skinned -> good resistance to fungal diseases

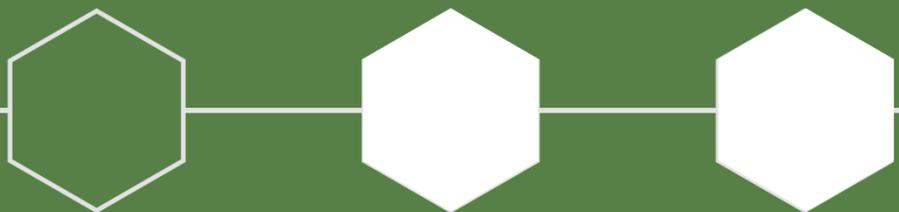




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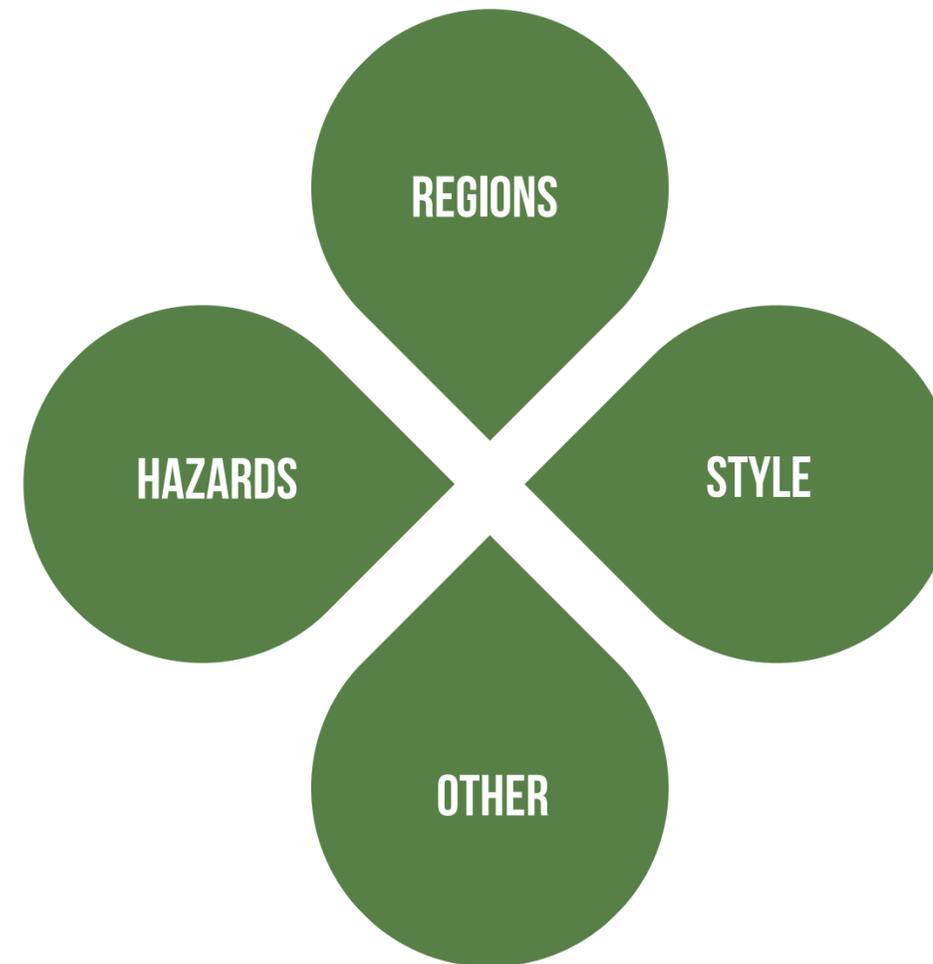
# CATARRATTO

MID TO LATE RIPENING



- disease resistant

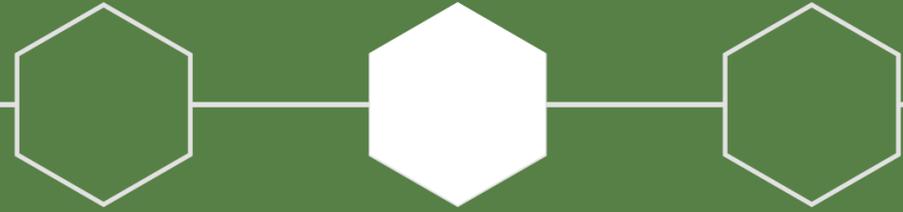
- Sicily, IT: most planted grape (33% of total) -> in many DOCs, e.g.
  - Alcamo Bianco DOC: min 60% Catarratto



- light intensity
- lemon and herbal notes
- high acidity
- M alcohol
- acceptable to good quality
- typically inexpensive

- high yielding

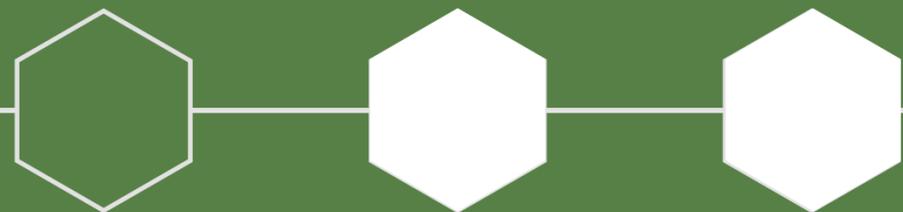




MID BUDDING

# MOSCHOFILERO

MID TO LATE RIPENING



- Greece, mainly in Mantinia (Peloponnese)



- aromatic wines:
  - ~Muscat
  - citrus, rose petals, spices
- high acidity
- light body, relatively low alcohol (12%)
- pink-skinned => pink hue
- also as rosé (skin contact)

- prized for its quality potential



Potpouri



Honeydew



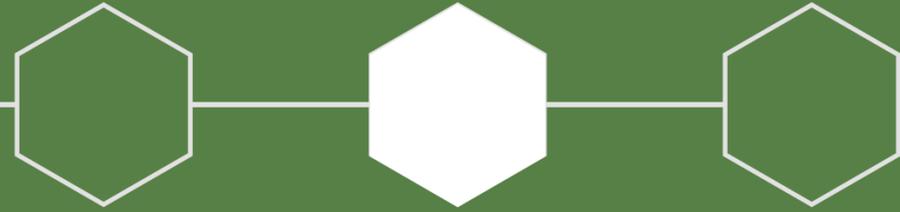
Pink Grapefruit



Lemon



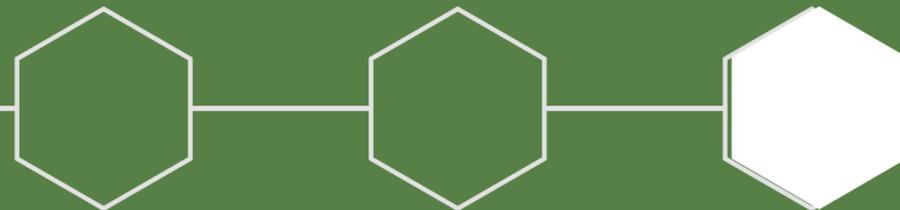
Almond



MID BUDDING

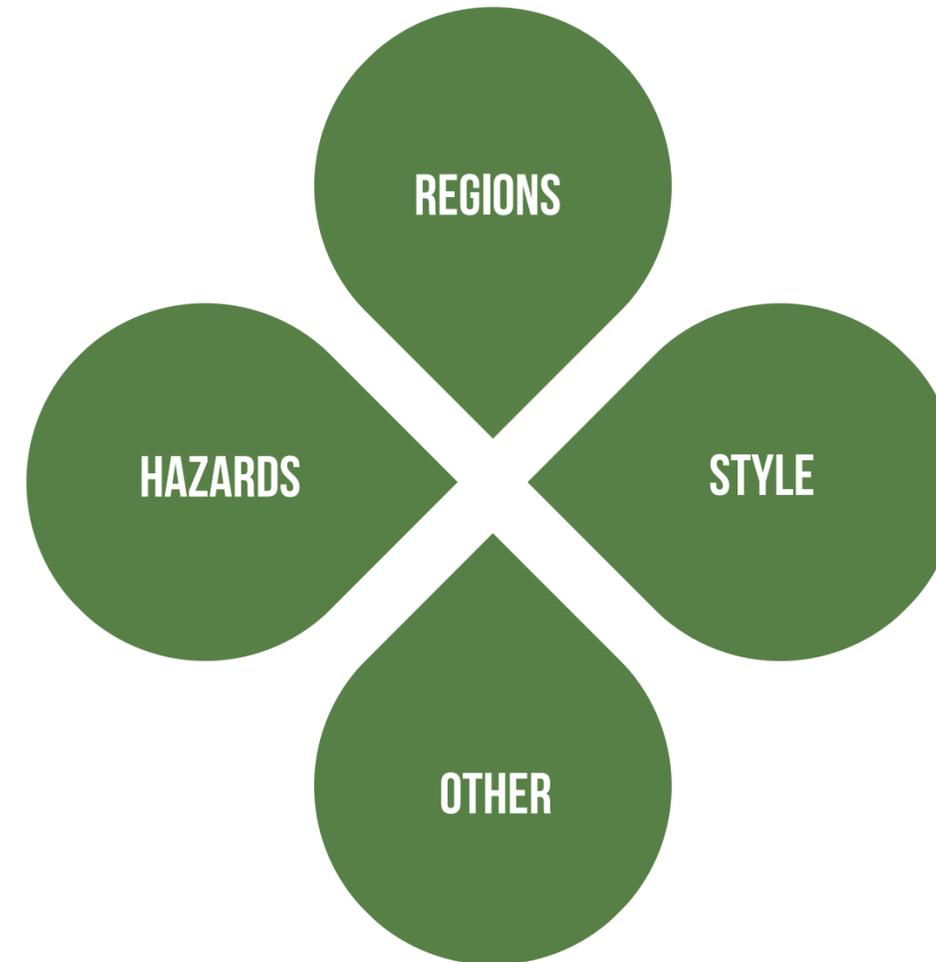
# BOURBOULENC

LATE RIPENING



- S. Rhône
- South of France, e.g. La Clape AOC, Corbières AOC,

- resistant to botrytis bunch rot:
  - loose bunches
  - thick skins



- typically in white S. Rhône blends:
  - lemon flavour
  - M+ acidity
  - M alcohol



Grapefruit

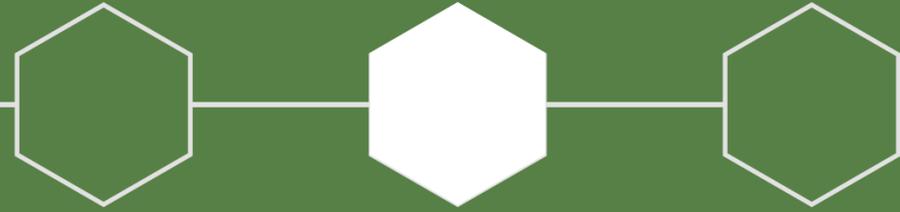


White blossom



Lemon

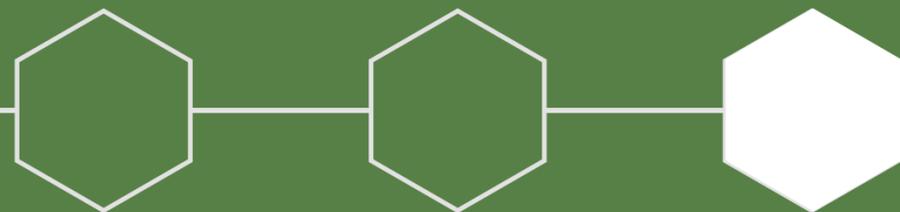
- loose bunches, thick skins => necessary disease resistance for late ripening
- grows well in warm, dry locations



MID BUDDING

# CARRICANTE

LATE RIPENING



- fungal diseases

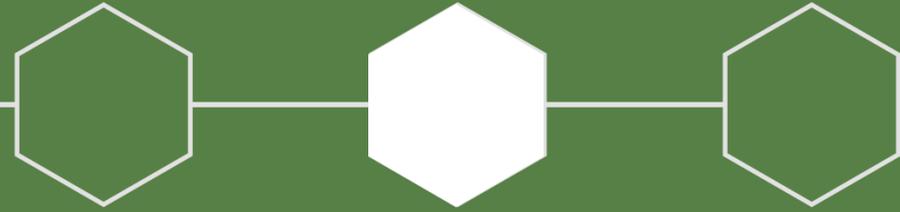
- Sicily, IT
  - main part of blend in Etna Bianco DOC
    - min required: 60%, if blended: with Catarratto
    - most producers use up to 100%



- M intensity
- lemon and green apple
- high acidity
- M alcohol
- normally MLF to reduce acidity
- typically aged in old oak for extra texture
- very good to outstanding quality

- grows successfully at high altitudes (up to 1000m)  
-> large diurnal range helps to retain high acidity

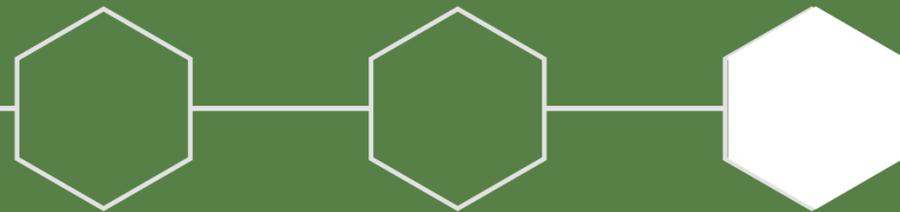




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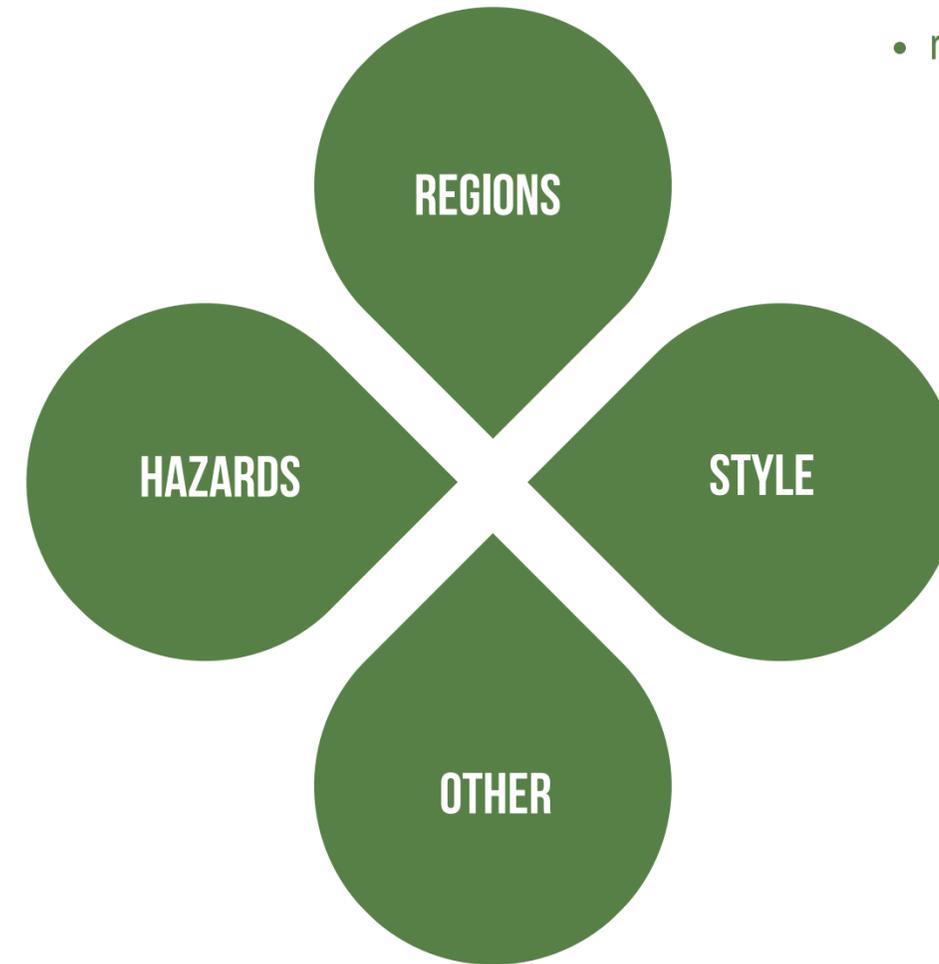
# ZIBIBBO / MUSCAT OF ALEXANDRIA

LATE RIPENING



- Sicily, IT ('Zibibbo')
  - especially island of Pantelleria (close to Tunisia)

- heat and drought resistant



- range of styles:
  - dry: stainless steel, early release, aromatic Muscat character
  - late harvest: picked 1 week later; F stopped to retain RS for a sweet style
  - passito: semi-dried grapes (trad. sun-dried) -> high lvls of residual sugar
    - deep lemon colour
    - pronounced intensity
    - cooked orange, apricot, honey
    - sweet, with high alcohol
    - very good to outstanding
    - premium and super-premium

- Pantelleria: intense sunlight, heat and drying winds => only most drought-resistant varieties can flourish
- low bush vines in individual planting holes -> conserve water and protect from the wind

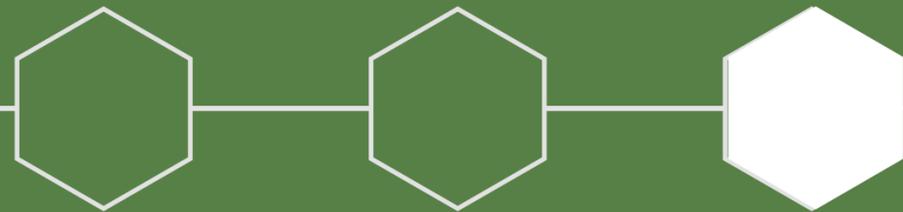




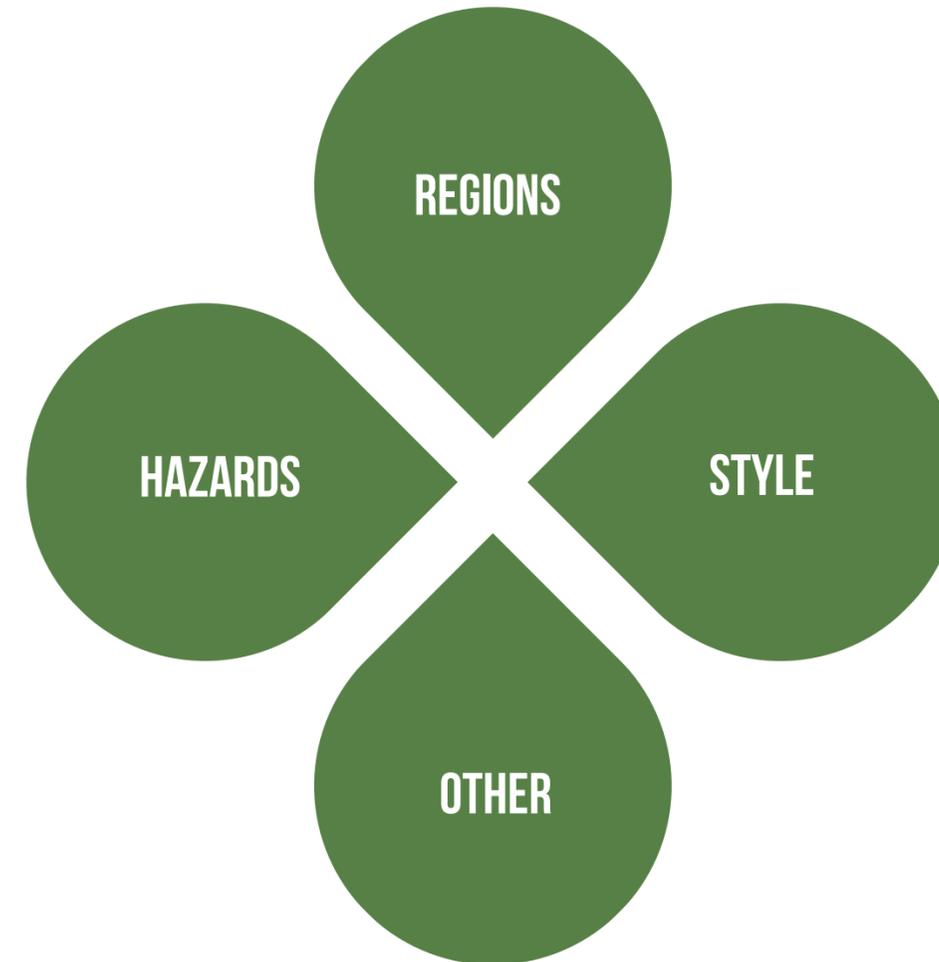
MID BUDDING

# HÁRSLEVELÚ

LATE RIPENING



- Tokaj, HU (2nd most planted variety: 18%)



- mainly supporting role in blends, fruitier than Furmint:
  - white peach
  - orange blossom
  - linden flowers





MID TO LATE BUDDING

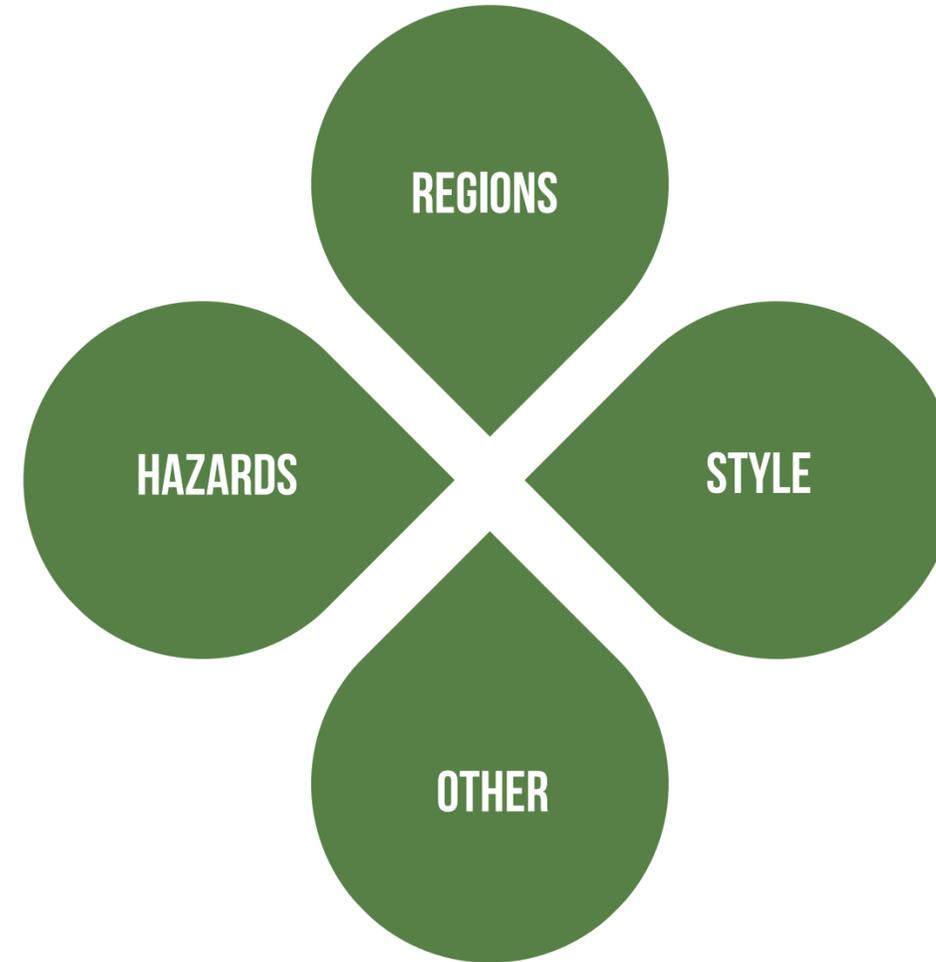
# GRUNER VELTLINER

MID RIPENING



- powdery and downy mildew
- grape rust mite

- Austria (32% of plantings)
- Australia: Adelaide Hills



- skins contain rotundone (peppery aroma)
- M+ to high acidity
- from simple (citrus, green fruit) for early drinking (inexpensive)
- to complex (pron. citrus & peach) to age (premium)

- does not thrive in dry soils => better in clay or loess
- high-vigour variety
- thick-skinned
- mid-ripening but still too late for much of N. Europe





MID TO LATE BUDDING

# PIQUEPOUL

MID TO LATE RIPENING



- Picpoul de Pinet AOC, Languedoc, FR

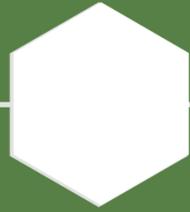
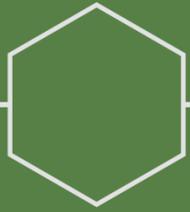
- botrytis bunch rot



- dry, M+ to high acidity
- M bodied
- M intensity lemon, light floral notes
- acceptable to good quality
- inexpensive to mid-priced



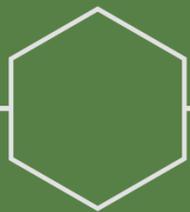
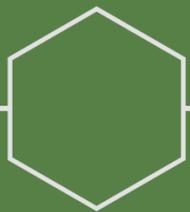
- appellation spelled 'Picpoul', grape variety: 'Piquepoul'
- retains acidity well in warm climate
- fertile, productive -> best pruned short
- suited to calcareous-clay or sandy soils in hot Mediterranean climates



MID TO LATE BUDDING

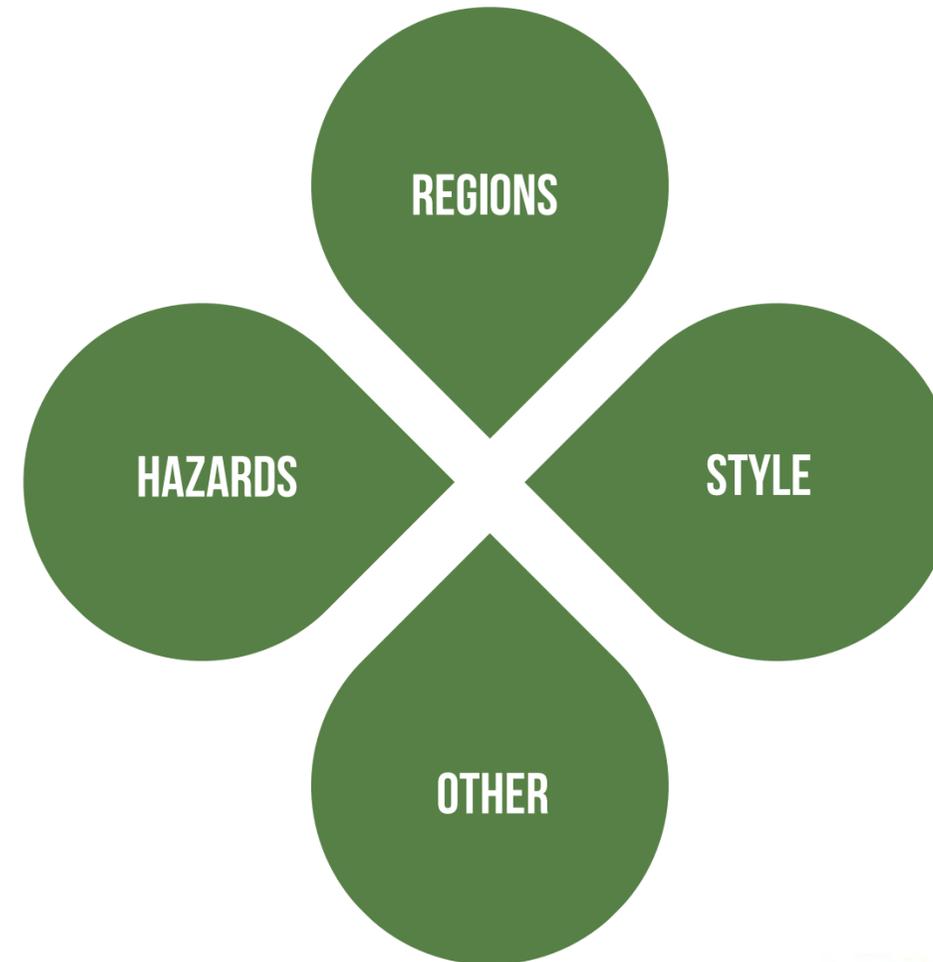
# GARGANEGA

LATE RIPENING



- winter cold
- mildew
- botrytis

- Soave, Veneto, IT



- M intensity
- lemon, apple/pear, white pepper
  - ripest examples: stone fruit
- high acidity
- M body
- usually unoaked
- best: ageworthy: almonds, honey
- good to very good, some outstanding
- inexpensive to mid-priced, some premium
- also: appassimento (Recioto di Soave DOCG)

- vigorous, very productive
  - traditionally: on pergola system
  - now: may be trellised
- vines on plain: fertile sandy & alluvial soils
  - > fruity, M acidity, meant to drink young



Peach



Honeydew



Tangerine



Marjoram



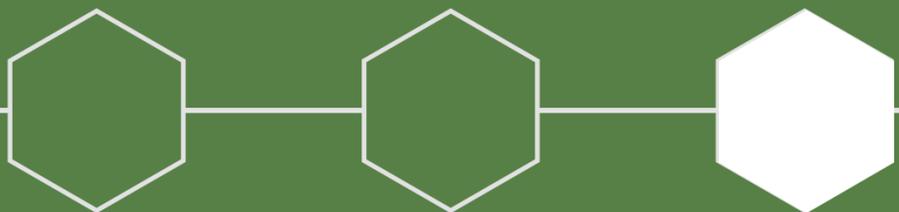
Saline



MID TO LATE BUDDING

# VERDICCHIO

LATE RIPENING



- powdery mildew
- downy mildew
- botrytis bunch rot

- IT: Marche
  - Verdicchio dei Castelli di Jesi DOC:
    - larger zone; floral & fruity wines
  - Verdicchio di Matelica DOC
    - continental climate, long GS, fuller bodied, higher acidity, less overtly fruity



- pale lemon colour
- M- intensity
  - blossom, apple, fennel, almonds
  - slightly bitter finish
- high acidity
- M body
- all quality levels
- most entry-level: no MLF



- first 4 buds: sterile => planted at low densities so the vine gets space
- retains high acidity when ripe

MID TO LATE BUDDING

# PASSERINA

LATE RIPENING

- good disease resistance
- autumn rain

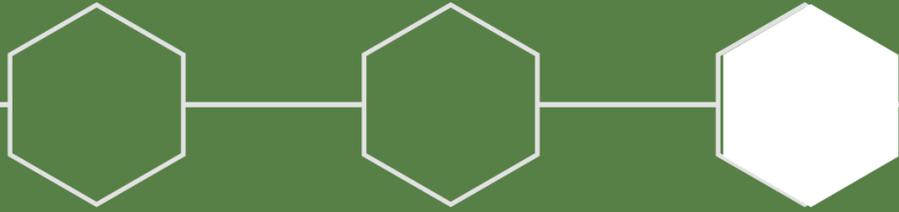
- IT: Marche
  - Marche IGT
  - Offida Passerina DOCG
- IT: Abruzzo



- ripe lemon and yellow apple
- naturally high acidity, but loses it quickly once fully mature

- naturally high acidity, but loses it quickly once fully mature => harvest dates!

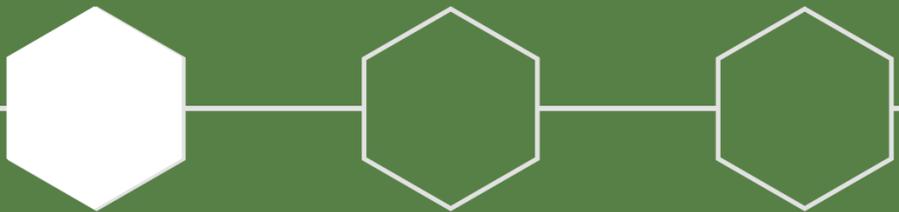




LATE BUDDING

# SAUVIGNON BLANC

EARLY RIPENING



- FR: Central Loire, Bordeaux, South West, IGP Pays d'Oc
- Germany. Austria: Styria. Greece, NE Italy, Central Italy
- ES: Rueda, Rioja, Penedès, Costers del Segre
- PT: Bairrada, Lisboa, Tejo
- New Zealand (Marlborough, Canterbury); Australia
- USA (California, NYS), Chile, Argentina, South Africa



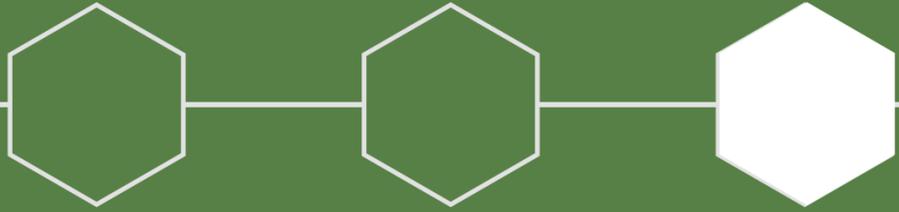
- powdery mildew
- botrytis bunch rot
- trunk diseases (Esca, Eutypa)



- pronounced intensity aromas
- cooler: gooseberry, grapefruit, wet stone, grassy, asparagus, green bell pepper (methoxypyrazines)
- warmer: riper passion fruit
- high acidity
- M body, M alcohol

- high vigour grape variety -> best on poor soils & careful canopy management (avoid shading)
- row orientation & canopy management affect flavour profile:
  - shadier: green pepper, grassy notes
  - sunlight: tropical fruit flavour
- fashionable, popular in today's market

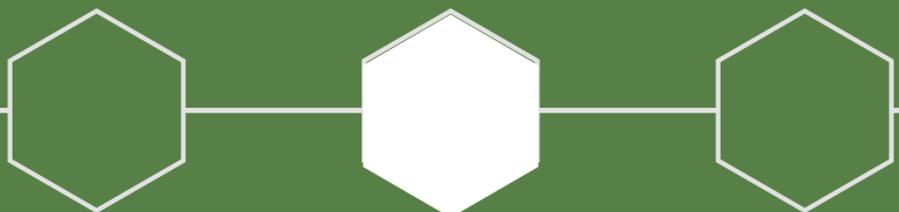




LATE BUDDING

# MARSANNE

MID RIPENING



- powdery mildew
- botrytis bunch rot
- mites

- slopes of N. Rhône, FR: varietal or blended with Roussanne
- S. Rhône: usually part of blend



- M lemon colour, sometimes gold
- low intensity honeysuckle, lemon and apricot
- M acidity
- oily texture, full bodied
- M to high alcohol



Quince



Mandarin Orange



Apricot

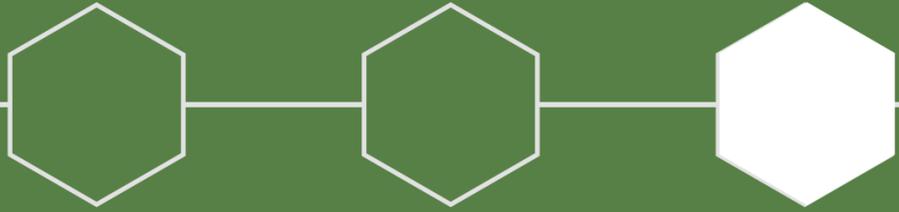


Acacia



Beeswax

- vigorous and productive => reduce yields for quality wines
- best on stony and low-fertility soils



LATE BUDDING

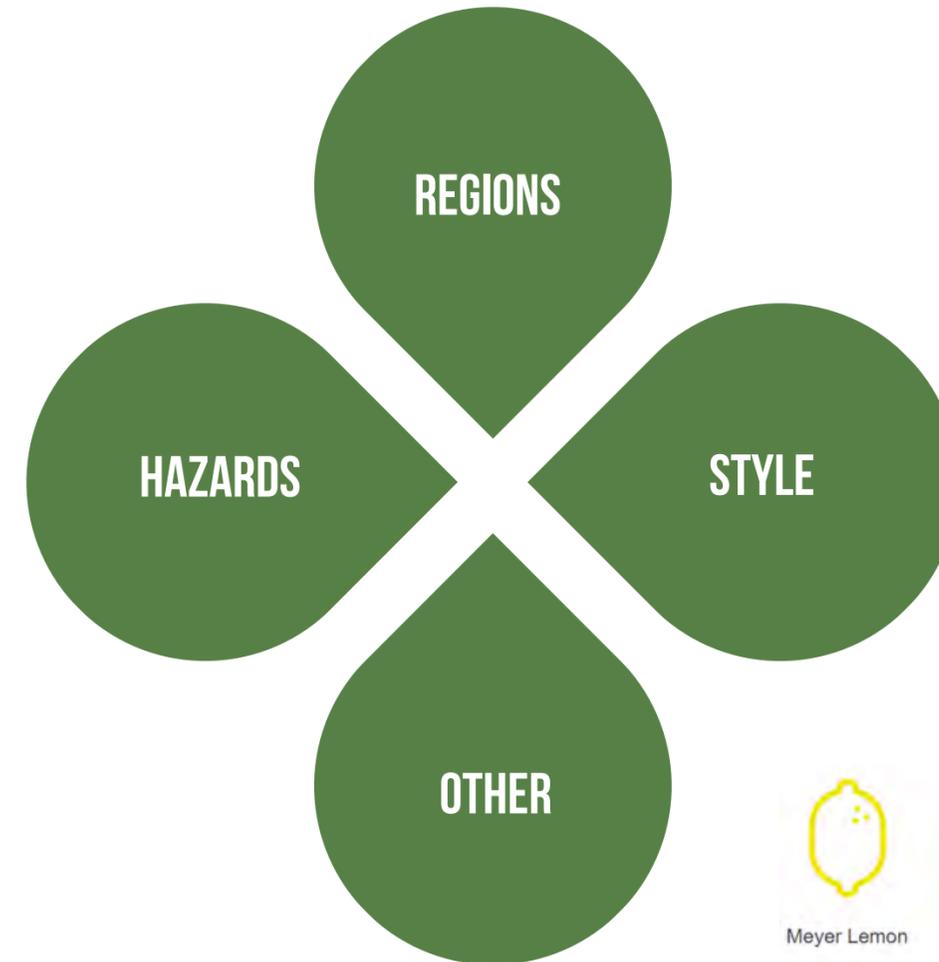
# ROUSSANNE

MID RIPENING



- poor wind resistance
- coulure => variable yields
- very susceptible to powdery mildew, botrytis bunch rot & mites

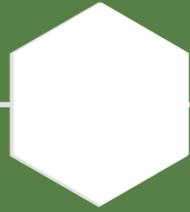
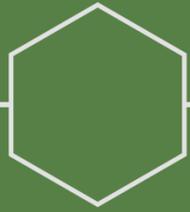
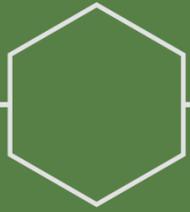
- N. Rhône (some single varietals; often blended with Marsanne)
- S. Rhône (some single varietals; often blended with Clairette, Grenache Blanc, ...)



- lemon colour, sometimes gold
- M to M+ intensity pear, herbal notes
- M to M+ acidity
- M to high alcohol
- ages quicker than Marsanne



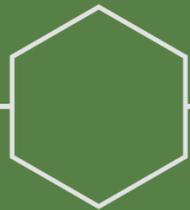
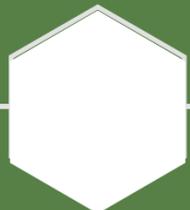
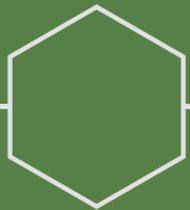
- best on low-fertility, well-drained soils
- careful site selection (poor wind resistance)
- variable yields (coulure)
- hard to grow, labour intensive (diseases, etc.) => costs



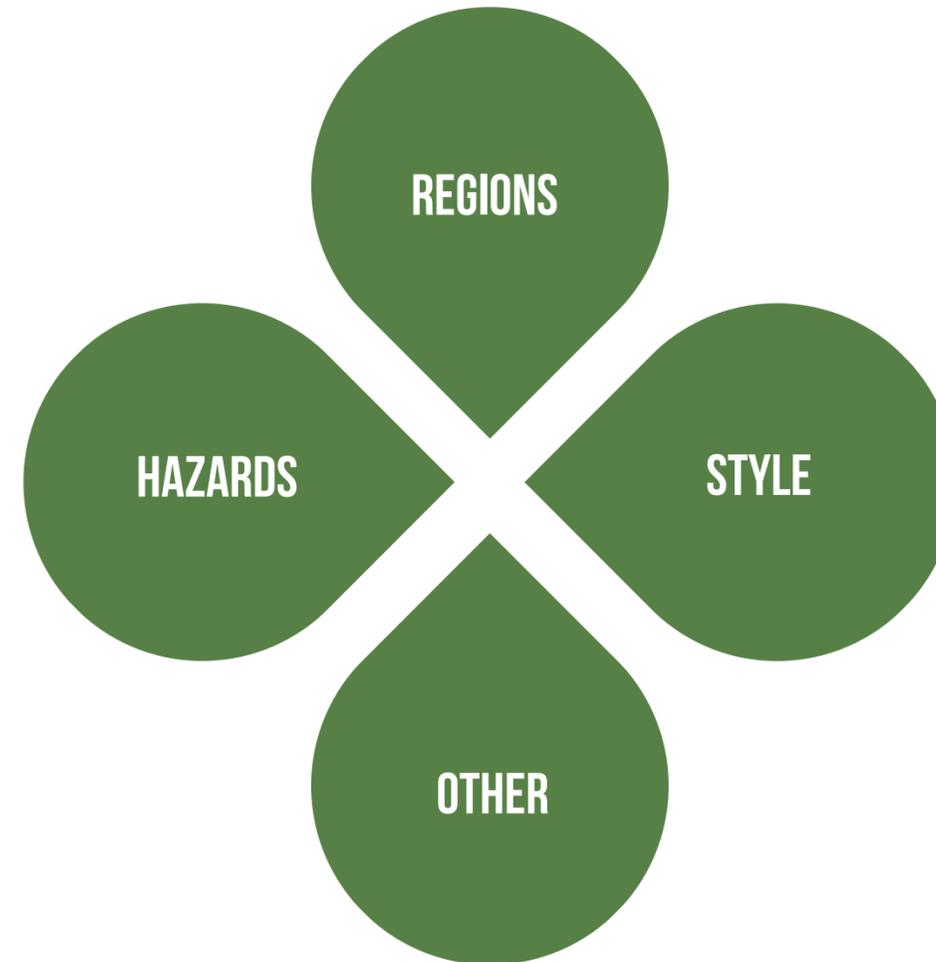
LATE BUDDING

# HONDARRABI ZURI

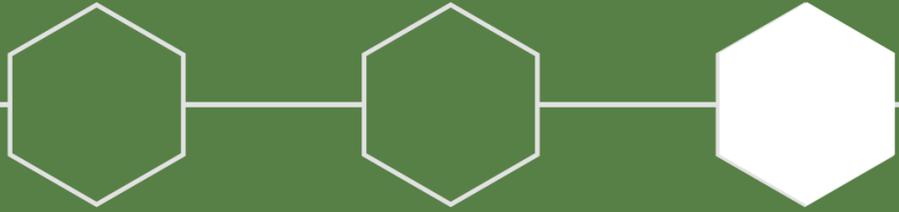
MID RIPENING



◦ ES, Basque Country: Txakoli DO



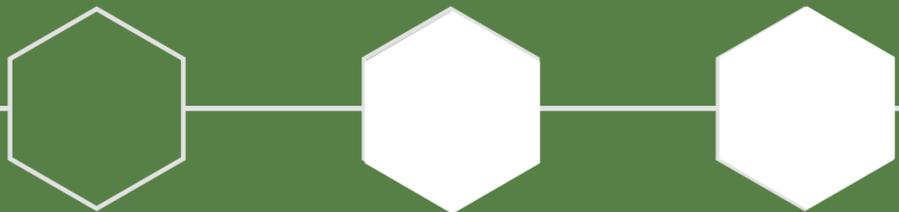
- high acidity
- fresh apple, pear, lemon
- M- body
- low alcohol
- sometimes a light spritz
- some: more texture and complexity:
  - lees contact
  - oak maturation
  - bottle ageing before release
- majority: dry white wine; also: rosado, red, sweet whites, sparkling wines



LATE BUDDING

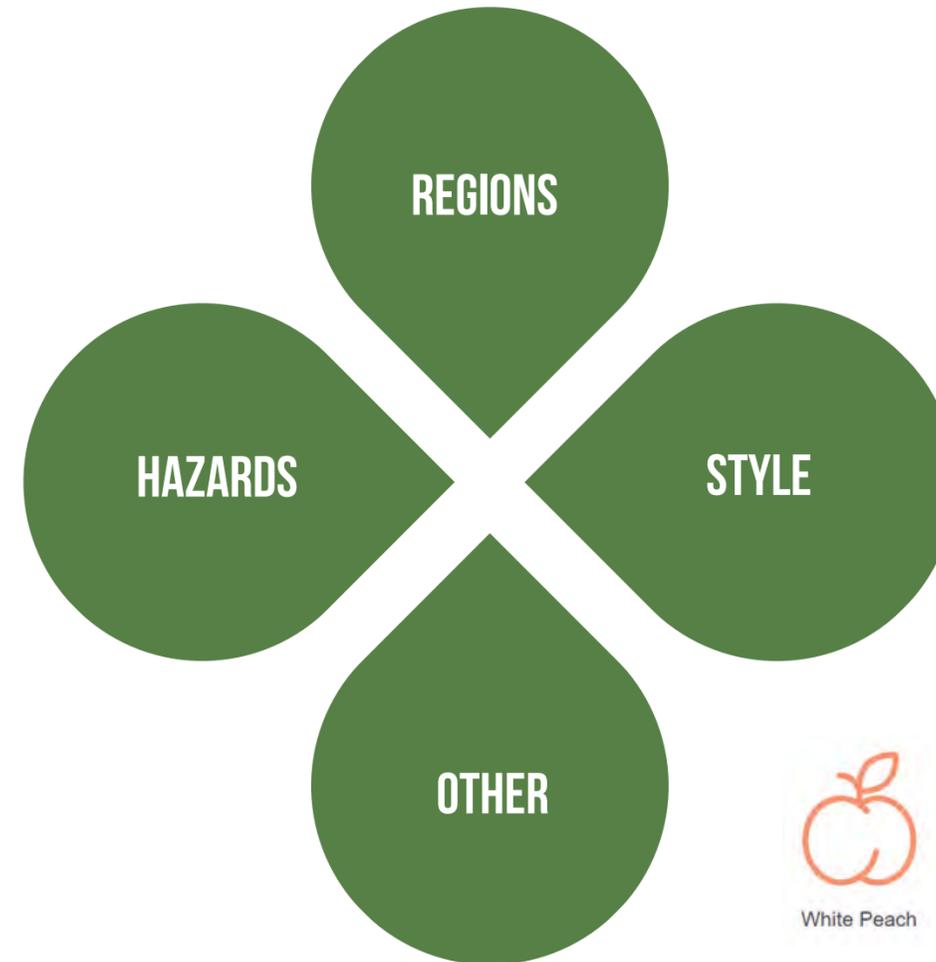
# TREBBIANO TOSCANO / UGNI BLANC

MID TO LATE RIPENING



- downy mildew
- eutypa dieback
- otherwise good disease resistance

- IT: Veneto, Central Italy (Tuscany, Lazio, Abruzzo, Marche)
- FR: 2nd most planted variety after Merlot
  - for Cognac and Armagnac in SW FR
  - also: in still white blends (SW & S France)



- neutral flavours:
  - M-, lemon, herbal
- high acidity => important part of Vin Santo blend
- low flavour intensity and lack of fruitiness => declining popularity



White Peach



Lemon



Green Apple

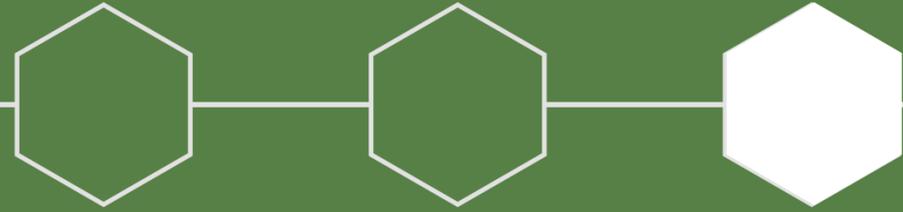


Seashell



Basil

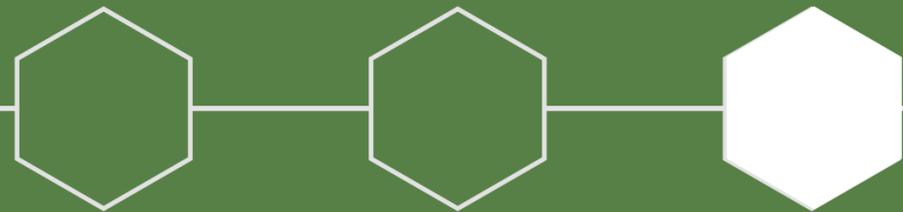
- vigorous and high yielding => very popular in the past
- ripens well in sunshine and heat -> retains high acidity
- in France: mainly for brandy production
- can be part of Chianti blend (up to 10% white grapes allowed)



LATE BUDDING

# RIESLING

LATE RIPENING



- Alsace, FR; Germany; Austria (only 4% of plantings); NE Italy; Central Italy; Spain; Portugal
- USA (California, Oregon, Finger Lakes, Wash. State)
- Ontario, CA
- Australia; New Zealand
- Chile; Argentina; South Africa

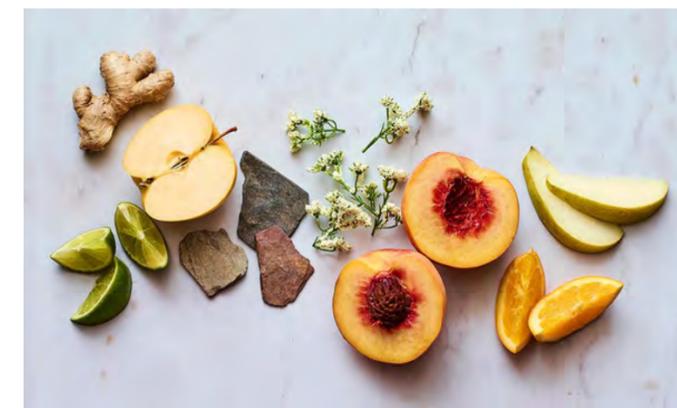


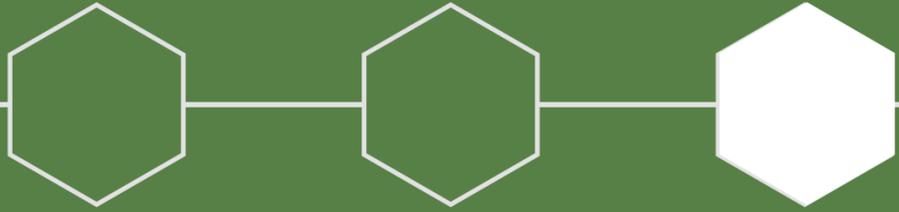
- good disease resistance to downy mildew
- fairly resistant to powdery mildew & botrytis bunch rot
- sensitive to grapevine yellows (bacterial)
- susceptible to noble rot
- tolerant of cold winter t°



- cold hardy
- needs good sites to fully ripen:
  - sun exposure & drainage & long GS)
  - => there: fairly high Y (e.g. Alsace: 70 hL/ha)
  - e.g. Niederösterreich, AT: planted in warmest sites on thin soils
- can produce high natural levels of sugar

- M to pronounced intensity
- usually unoaked
- from green fruit to tropical;
  - apple, citrus (lemon, grapefruit)
  - stone fruit (peach)
- stony/steely; floral (white flowers, honeysuckle)
- with age: toast, honey, petrol, nutty
- range of styles from dry to sweet
- high acidity
- M to full body
- M alcohol

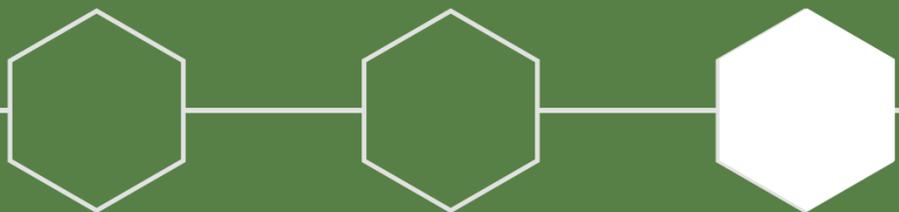




LATE BUDDING

# CLAIRETTE

LATE RIPENING



- early autumn rains

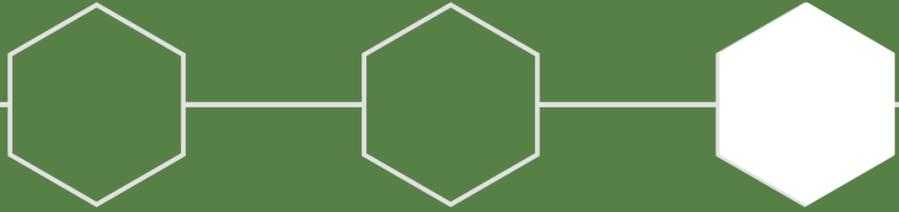
- FR: S. Rhône, Provence



- mainly in white blends:
  - freshness and fruit
  - white flower, fennel, apple and grapefruit
  - high alcohol
  - low to M- acidity



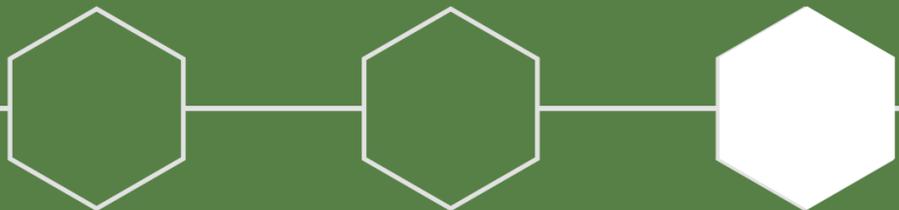
- vigorous variety -> pruned short, bud removal
- best in low fertility, dry soils
- grows very upright -> wind resistant without staking
- oxidises easily => careful handling in winery!



LATE BUDDING

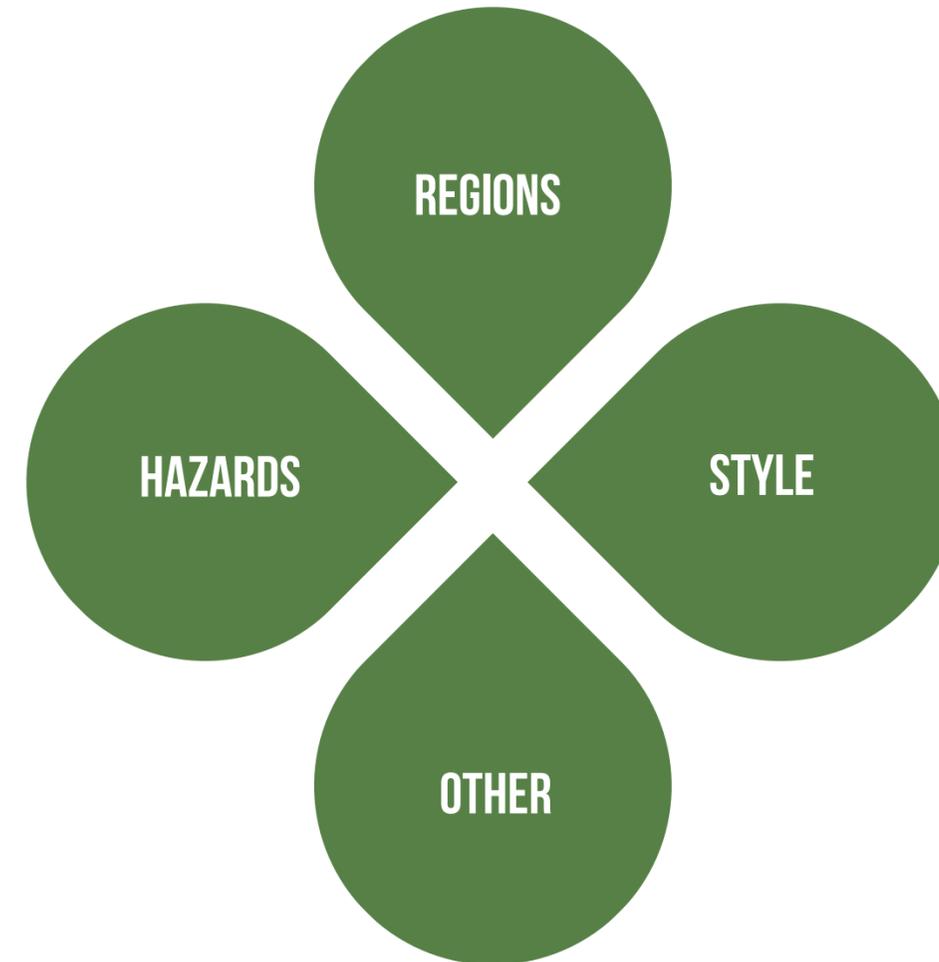
# WELSCHRIESLING

LATE RIPENING



- thin skins -> can be affected by noble rot

- Austria (2nd most planted white grape variety)
  - mainly in Steiermark
  - also Burgenland, around Neusiedlersee (for BA/TBA)
- NE Italy: 'Riesling Italico'



- usually fresh, neutral, unoaked dry style
  - acceptable to good quality
  - inexpensive
- sometimes: Sekt production
- BA/TBA - Neusiedlersee
  - high acidity
  - pronounced tropical and dried fruit
  - ageing potential
  - very good to outstanding quality
  - premium priced

- plantings in decline due to decrease in consumption of the simple, dry style

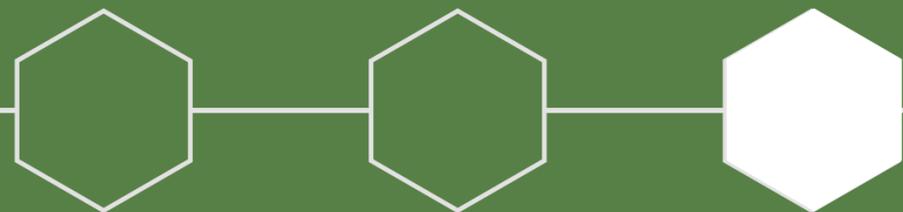




LATE BUDDING

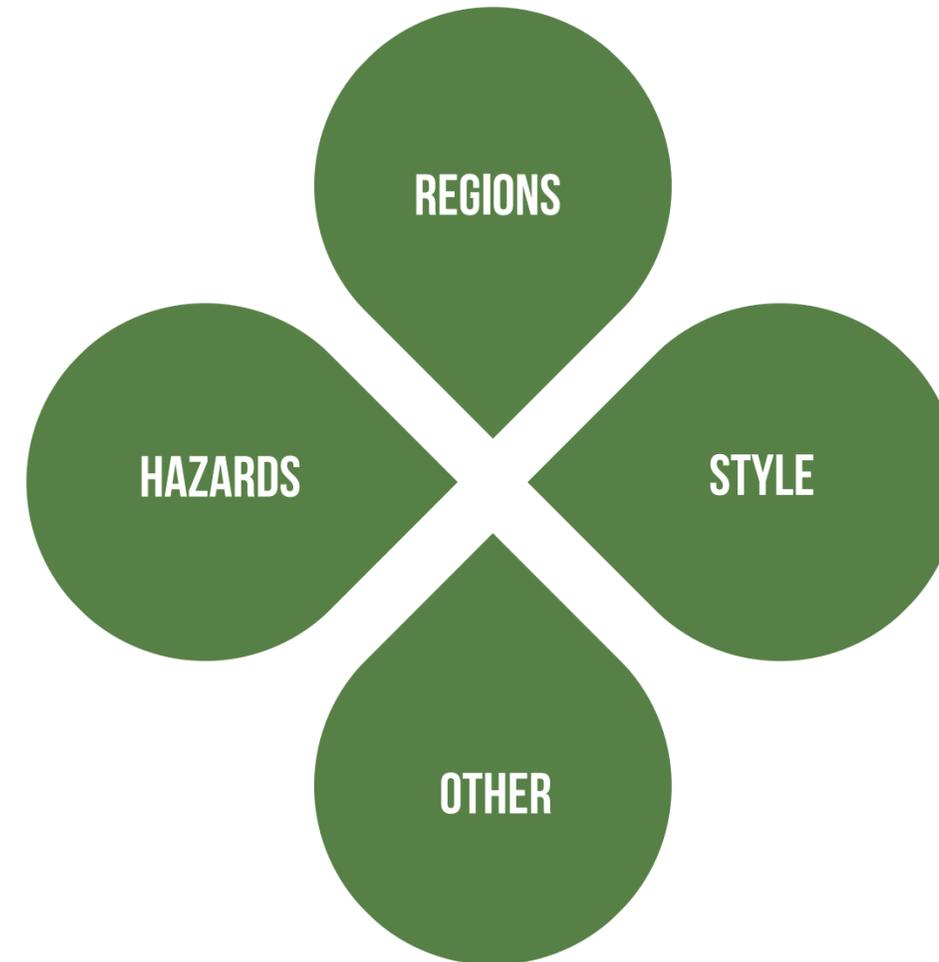
# MACABEO / VIURA

LATE RIPENING



- FR: Roussillon ('Macabeu')
- ES:
  - Catalunya ('Macabeo')
  - Rioja ('Viura'): 70% of plantings of white varieties

- botrytis bunch rot



- high yields / stainless steel
  - simple whites
  - early consumption
- lower yields / oak maturation
  - concentrated, complex
  - long ageing potential

- makes a range of inexpensive neutral wines, but also leading component in many premium-priced wines, F and matured in oak
- best suited to warm, dry sites



Honeydew Melon



Lime Peel



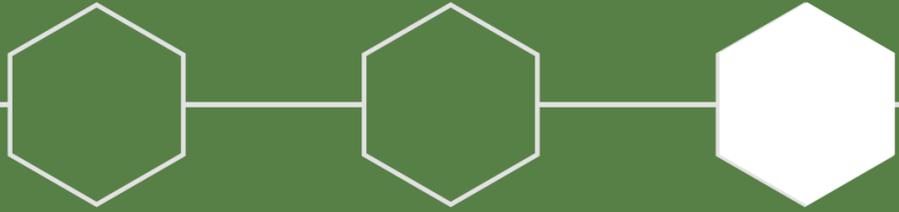
Lemon Verbena



Tarragon



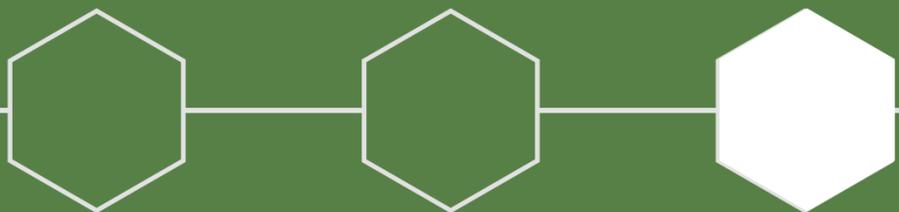
Hazelnut



LATE BUDDING

# ASSYRTIKO

LATE RIPENING



- Greece: originally from Santorini, now also widely planted on the mainland



- dry wines:
  - citrus, stone, tropical fruit
  - strong smoky/flinty character
  - some: (part) oak aged -> fuller body and more secondary character
- lusciously sweet (e.g. Vinsanto)



Lime



Passion Fruit



Beeswax

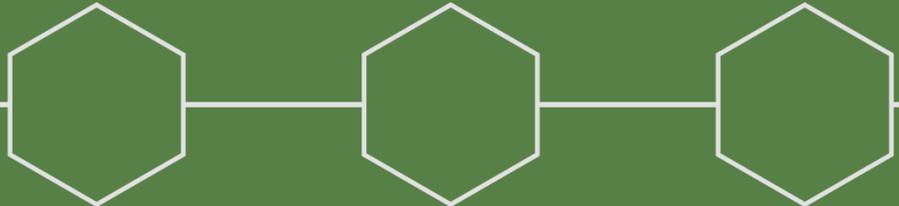


Flint



Saline

- Greece's best-known / most-prized indigenous white grape
- highly adaptable to different conditions
- vigorous, relatively productive
- retains high acidity (tartaric acid) when ripe, even in hottest conditions



? BUDDING

# VIDAL BLANC

MID RIPENING



- cold hardy

- USA: New York State (Finger Lakes)
- Canada: Ontario



- high acidity
- stone and tropical fruit: peach, mango
- dry as well as sweet styles
- Icewine:
  - F stops naturally at +- 9-11% abv
  - RS: 200-250 g/L



White Currant



Pineapple



Honeydew

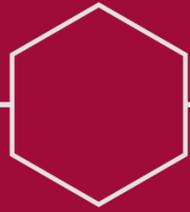
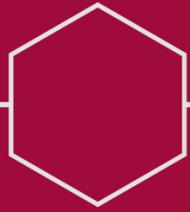
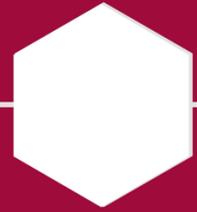


Lychee



Honeysuckle

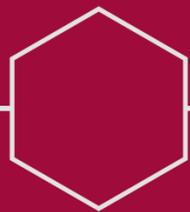
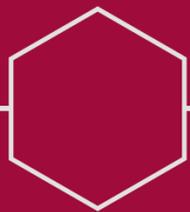
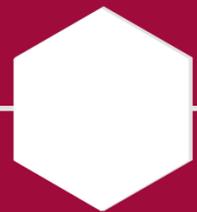
- French hybrid, producing the majority of IceWine
- can withstand Canada's harsh winters
- thick skins & ripens slowly => very suited for late-harvest wines and Icewine



EARLY BUDDING

# PINOT NOIR

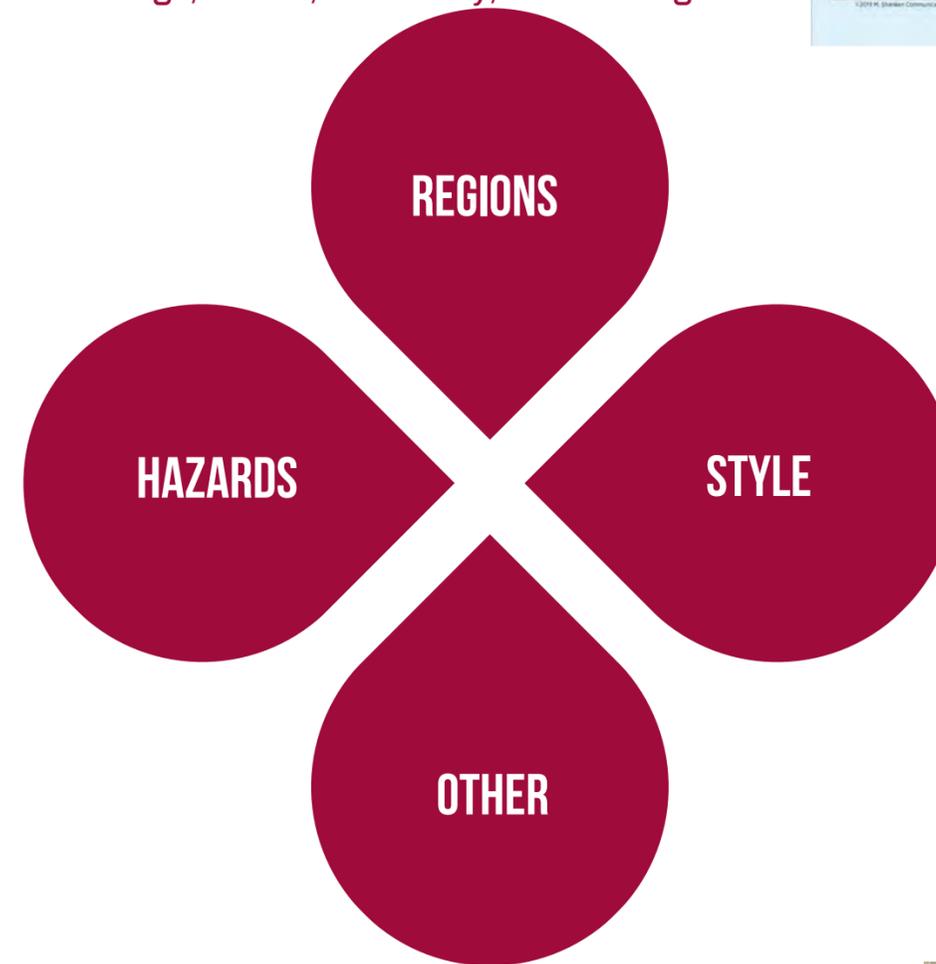
EARLY RIPENING



- FR: Burgundy, Alsace, Central Loire, Jura, Pays d'Oc
- DE (Spätburgunder - 11.5% of plantings)
- Also: AT; North-East IT; Some in ES, PT
- USA: Oregon; Washington State; Finger Lakes; California
- CL: Casablanca, San Antonio; AR: Patagonia, high up in Uco Valley
- Australia: Yarra Valley, Mornington Peninsula, Tasmania
- New Zealand: Marlborough, Nelson, Canterbury, Central Otago



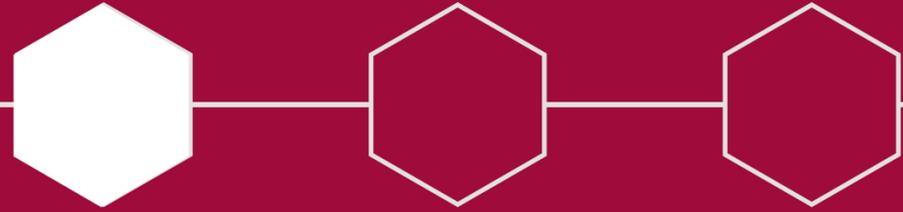
- spring frost
- tight bunches -> more prone to fungal disease e.g. grey rot
- downy and powdery mildew
- millerandage
- fan leaf and leaf roll viruses
- bacterial disease: Pierce's



- Burgundy style:
  - strawberry, raspberry, red cherry
  - village and above: light oak
  - low to M tannins (M+ in grand cru)
  - M alcohol
  - high acidity
  - ageing: earth, game, mushroom
- NZ style:
  - from fresh, fruity & juicy
  - to deeper coloured, up to full body
  - red cherry, black plum, some floral
  - many: Fr. oak 12-18m -> spicy

- prone to disease => more labour and cost intensive to grow
- yields must be limited for quality wines
- warm climates: ripens too fast, berries shrivel, risk of sunburn
- Dijon clones widely used around the world

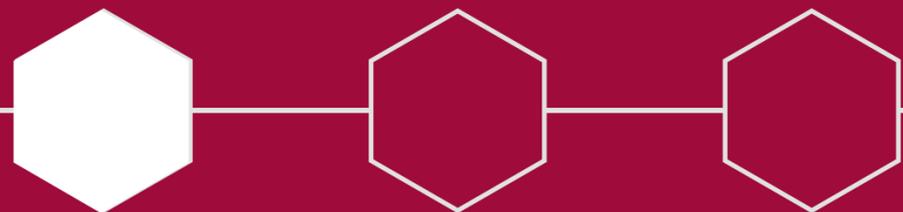




EARLY BUDDING

# GAMAY NOIR

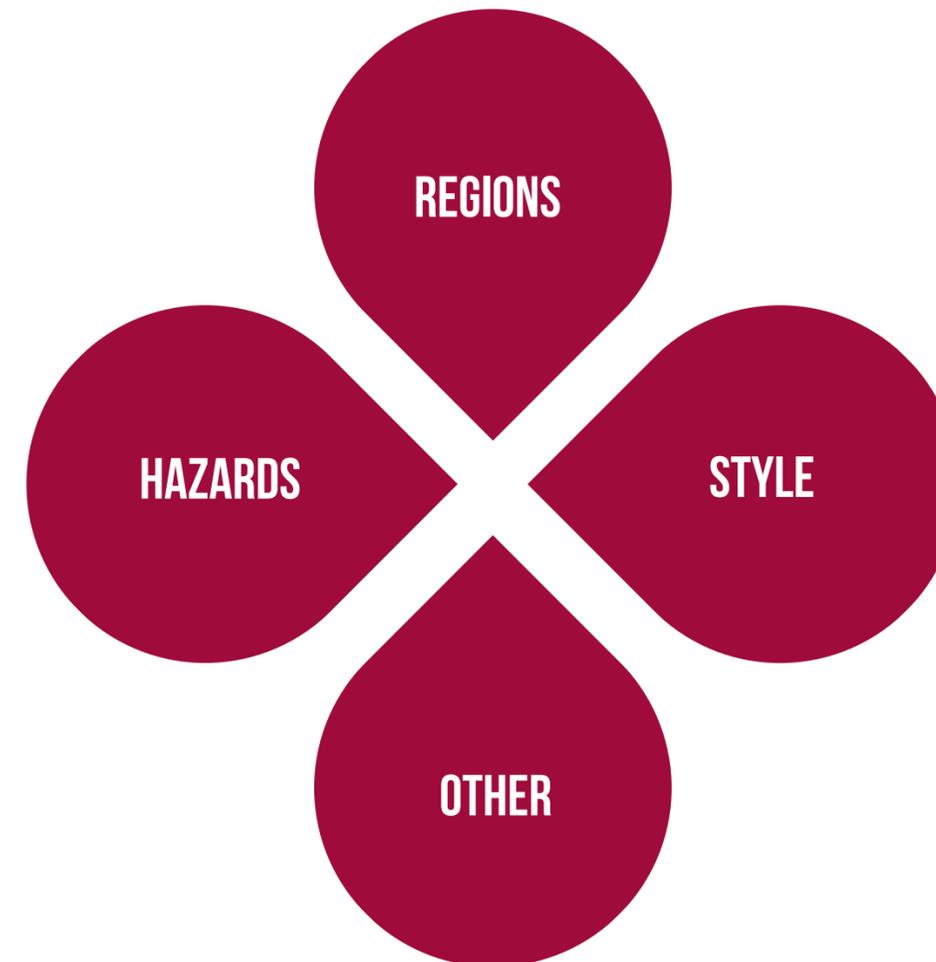
EARLY RIPENING



wine & words

- spring frost
- millerandage (in cold, damp, windy conditions)
- thin, delicate skin -> rot & wind damage (Beaujolais: Mistral)

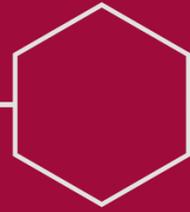
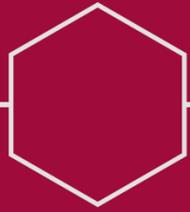
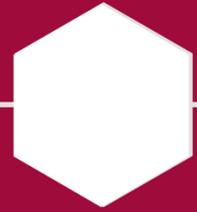
- Beaujolais, Burgundy, FR
- Touraine & Central Loire, FR
- Ontario, CA



- fresh and fruity
- purple colour
- M intensity red cherry, raspberry, red plum
  - kirsch / banana from (semi-)carbonic maceration
- M+ to high acidity
- light to M- body
- M alcohol
- low to M tannins

- productive grape => control yields for concentrated, ripe grapes
- high fertility => reduce # of buds
- traditionally: bush vines (still so on steeper slopes).
- now: more trellised -> mechanisation
- usually hand picked -> whole bunches required

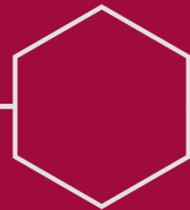
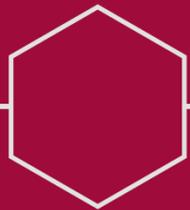
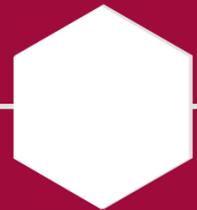




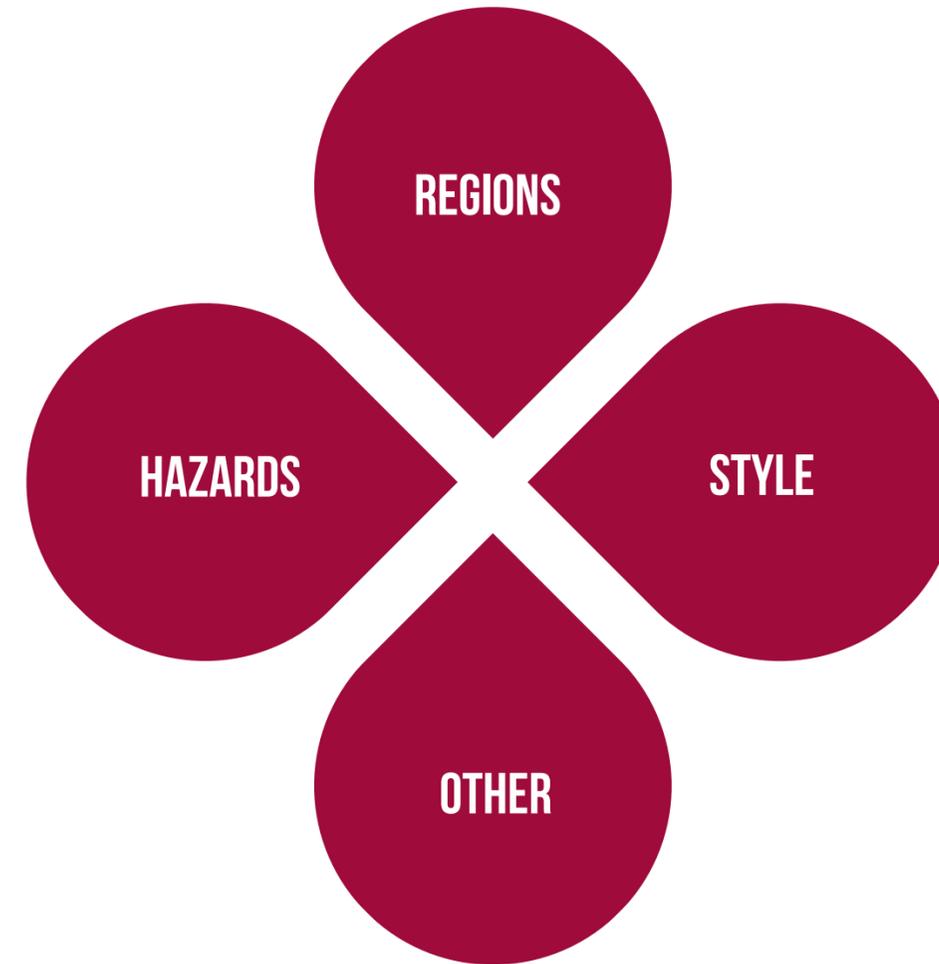
EARLY BUDDING

# POULSARD/ PLOUSSARD

EARLY RIPENING



- Jura, FR

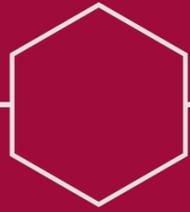
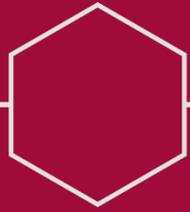
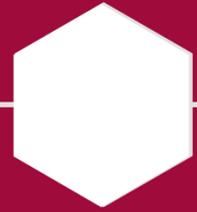


- spring frost
- coulure -> reduced yields
- fungal diseases (thin-skinned)

- very pale ruby, almost translucent
- light intensity red fruit (redcurrant, cranberry)
- low tannins
- high acidity
- light body; low end of M alcohol
- good to very good
- mid- to premium priced

- most planted black variety in Jura
- thin-skinned -> constant attention in vvd -> adds to cost

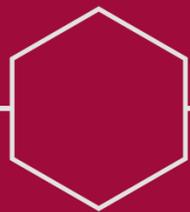
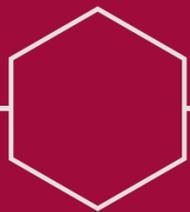
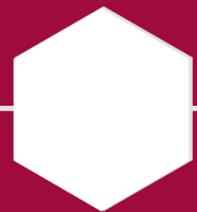




EARLY BUDDING

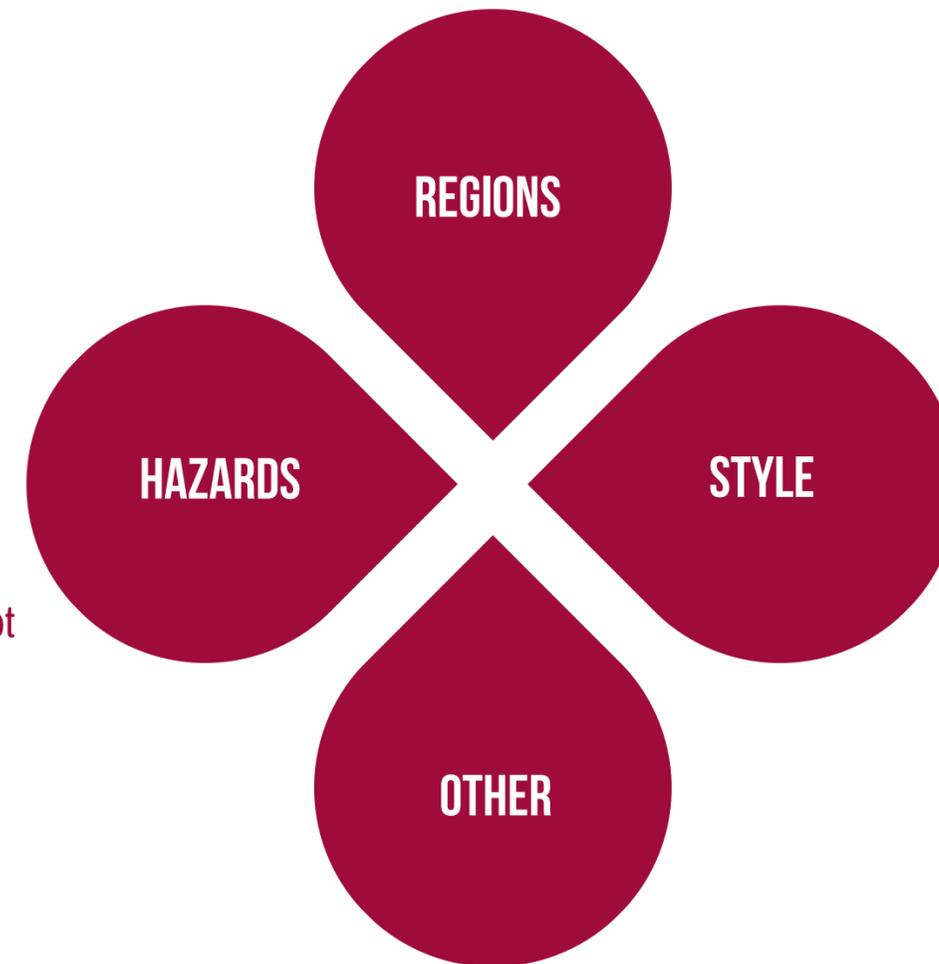
# TROUSSEAU

EARLY RIPENING



- poor flowering & coulure -> reduced yields
- resistant to fungal diseases (thick-skinned)
- can suffer from botrytis bunch rot

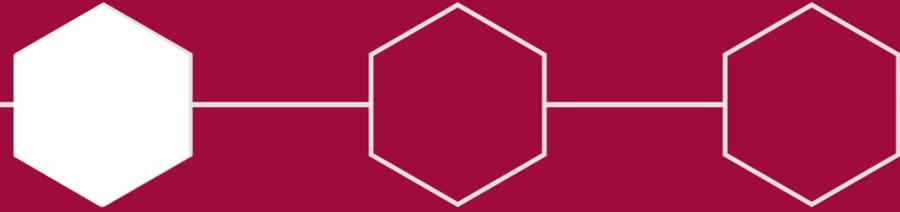
- Jura, FR
- Rioja, ES: 'Maturana Tinta'



- pale ruby
- light intensity red fruit (red cherry)
- low to M tannins
- M to high acidity
- light to M- body
- low end of M alcohol
- good to very good
- mid- to premium priced

- thick-skinned -> good disease resistance
- vigorous variety -> careful canopy management
- needs warm site to ripen fully:
  - e.g. warm gravels
  - planted on warm lower part of slope
  - planted on well-exposed higher, steeper slopes

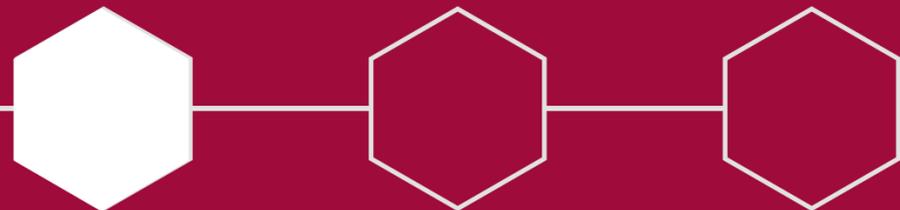




EARLY BUDDING

# TEMPRANILLO

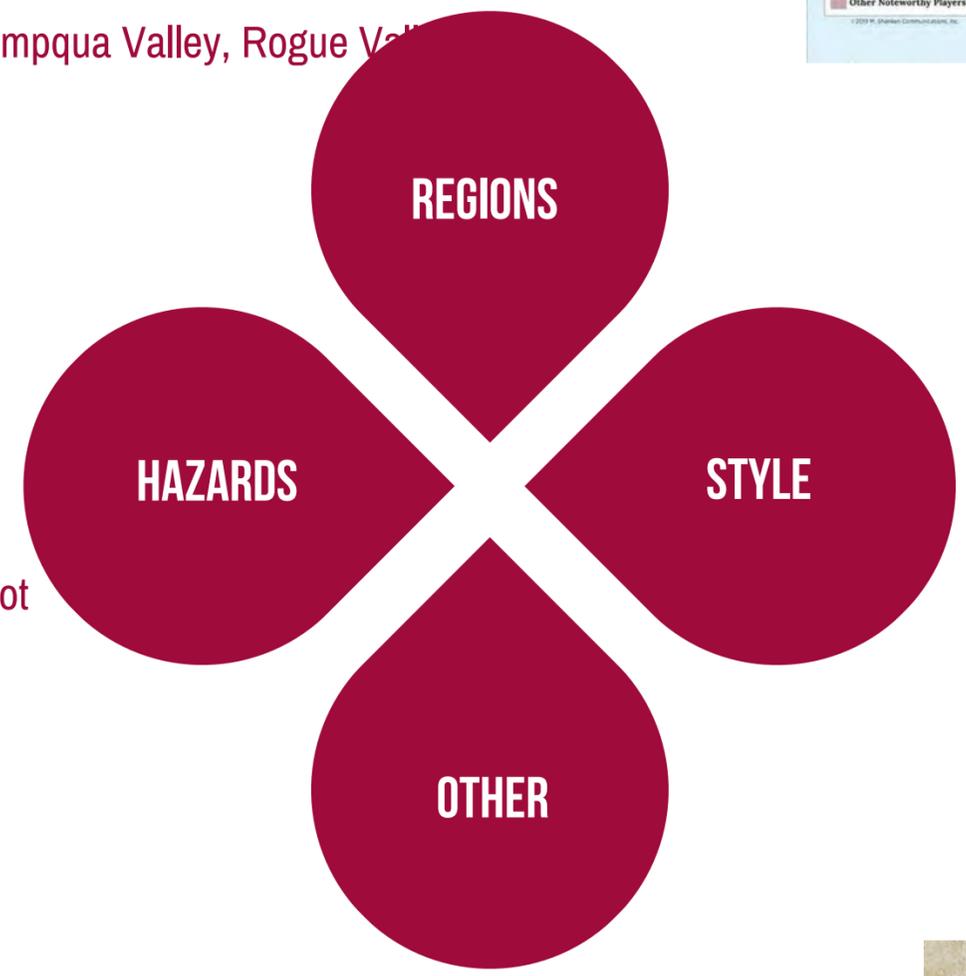
EARLY RIPENING



- several areas of Spain (different names). Leading component in Rioja, Ribera del Duero ('Tinto Fino', 'Tinta del País'), Toro ('Tinta de Toro'); Castilla-La Mancha ('Cencibel')
- PT: Douro ('Tinta Roriz'), other areas: 'Aragonez'
- USA:
  - California: Lodi AVA, Sierra Foothills AVA
  - Oregon: Umpqua Valley, Rogue Valley
- Argentina



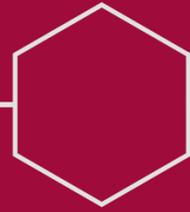
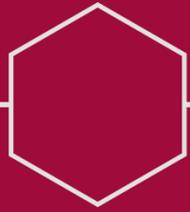
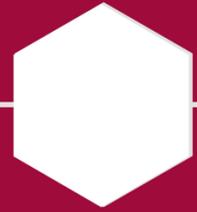
- powdery mildew
- eutypa dieback
- fairly resistant to botrytis bunch rot



- raspberry and black plum fruit
- M to M+ acidity
- M to M+ tannins
- single varietal or blended with other permitted grapes: see mindmaps at the end of this file

- finest wines in warm climates with cooling altitude, winds, ...
- small berries, rich in anthocyanins and tannins
- reliably produces larger yields
- Tinta de Toro: probably a biotype of Tempranillo, but with thicker skins (due to sun intensity). Some: separate autochthonous variety of Toro

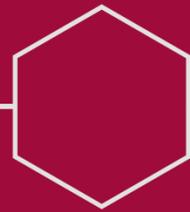
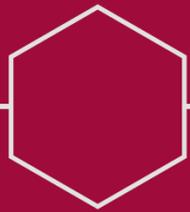
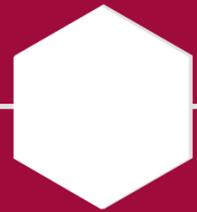




EARLY BUDDING

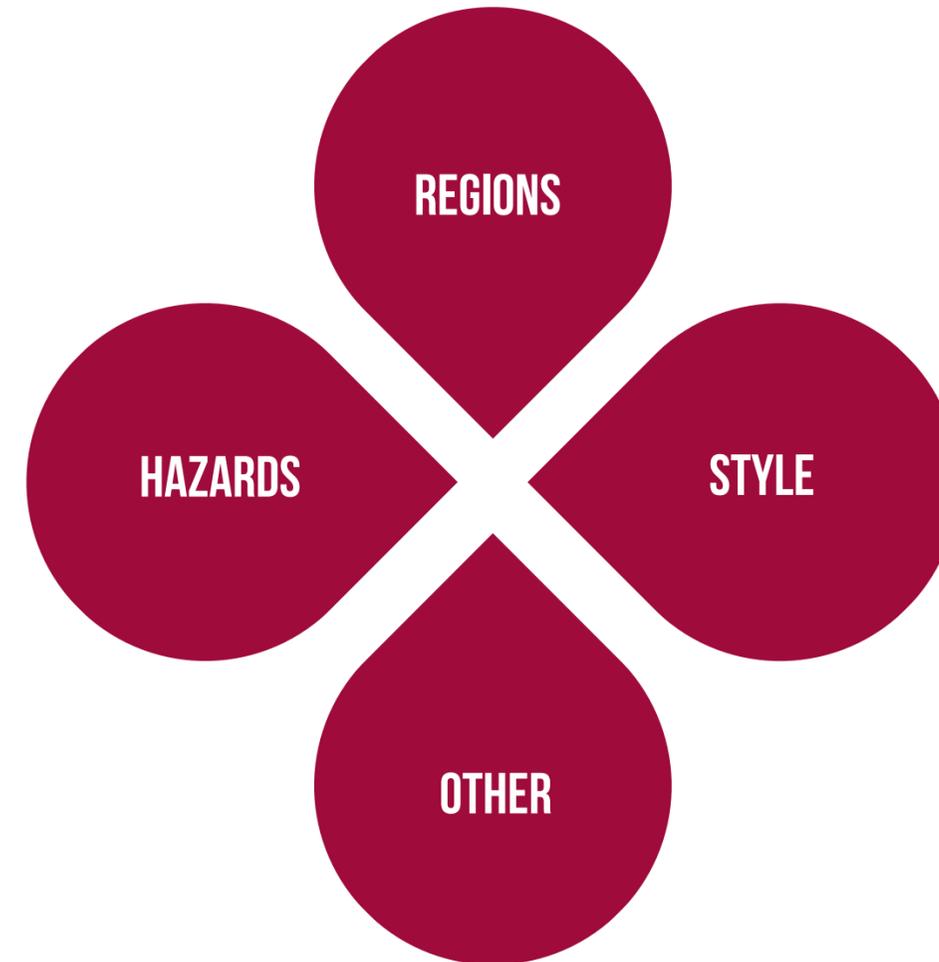
# PINOTAGE

EARLY RIPENING



- typically grown in Western Cape, SA

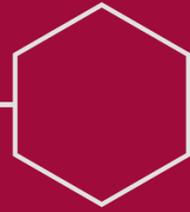
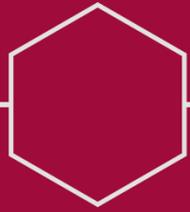
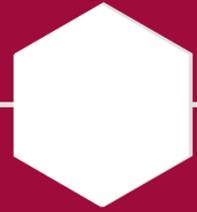
- early budding but rarely spring frost in warmer Western Cape
- moderately susceptible to fungal diseases



- bred at Uni of Stellenbosch in 1925
- PN x Cinsaut (known as 'Hermitage')
- short time on skins after F to produce deep colour (3 - 5 days ~style)

- small berries => deep colour
- reaches high sugar levels => potential high alcohol
- range of quality levels ~ yields and levels of sorting
- traditional style:
  - deep ruby colour
  - red plum & blackberry fruit
  - high tannins, full body, high alcohol
- modern, lighter, more elegant style:
  - M ruby colour
  - red-fruited, M tannins

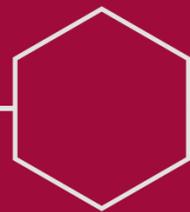
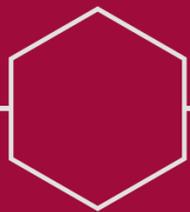
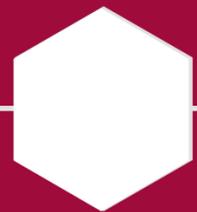




EARLY BUDDING

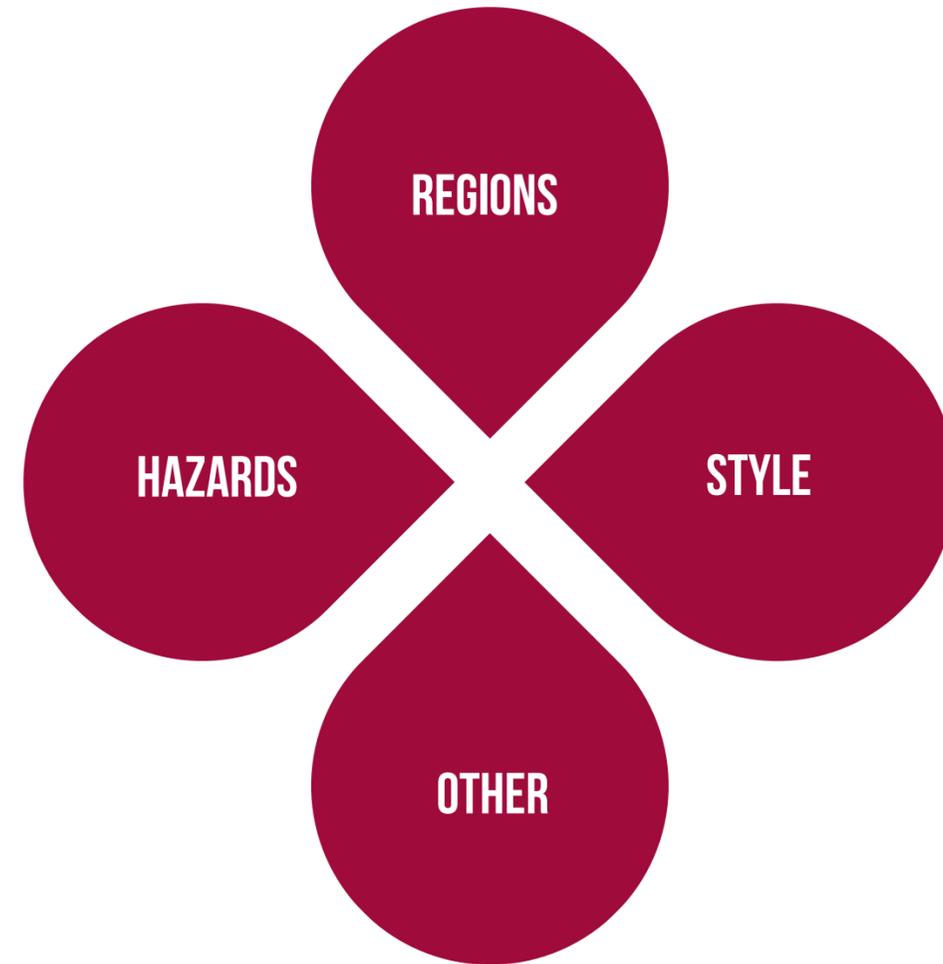
# ALFROCHEIRO

EARLY RIPENING



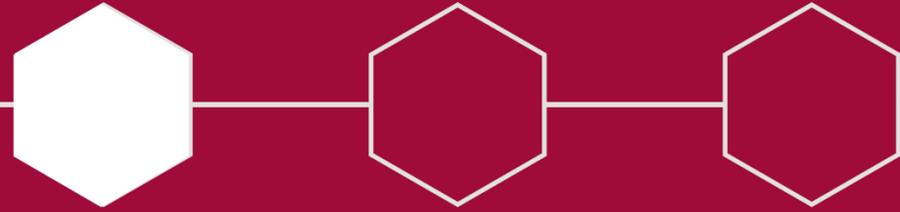
- PT: Dão, Bairrada

- powdery mildew
- botrytis bunch rot



- strawberry, blackberry
- M tannin
- M body
- usually soft, fruity style for early consumption
- sometimes for rosé production
- in blends: softens and lends ripe fruity flavours

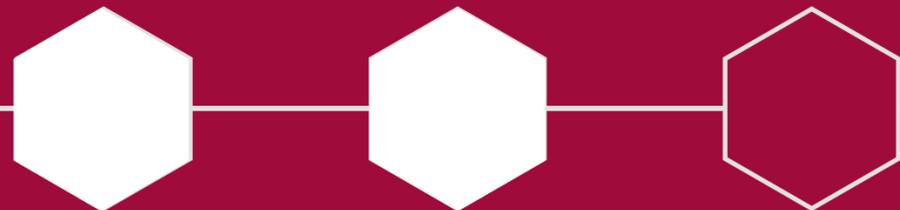




EARLY BUDDING

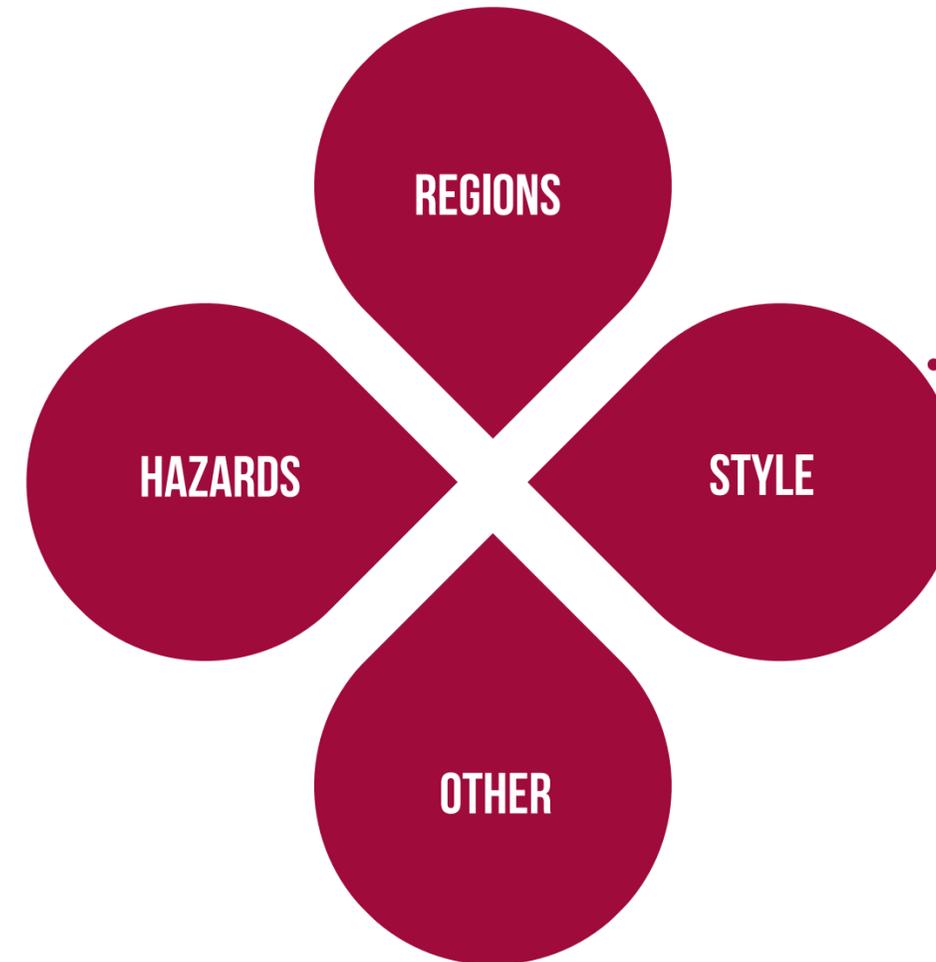
# MENCÍA

EARLY TO MID RIPENING



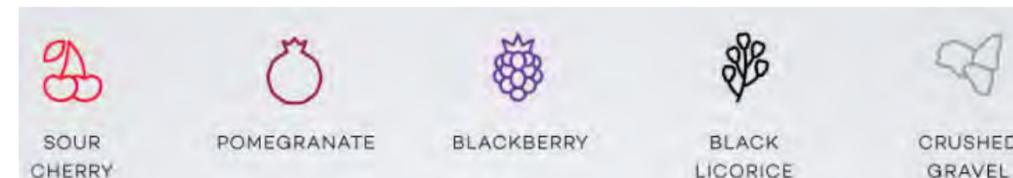
- ES:
  - Galicia: Ribeira Sacra DO, Valdeorras DO, Monterrei DO
  - Castilla y León: **Bierzo DO**
- PT: Dão ('Jaen')

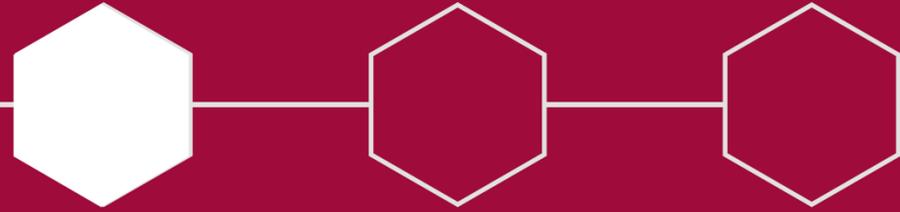
- wind damage
- fungal diseases



- M+ to high acidity, but loses it quickly
- inexpensive/mid-priced from flat/fertile areas:
  - fruity: raspberry, red cherry
  - M body, M tannin
  - early consumption
  - sometimes (semi-)carbonic mac.
- best: hillsides, good drainage, poor soils:
  - more concentrated ripe red cherry and plum, sometimes floral/herbal
  - M to M+ body
  - M to M+ tannins
  - higher alcohol
  - often matured in oak: spicy character
  - very good to outstanding
  - mid-priced to (super)-premium

- loses its M+ to high acidity quickly; accumulates sugar quickly -> can lead to high alcohol wines

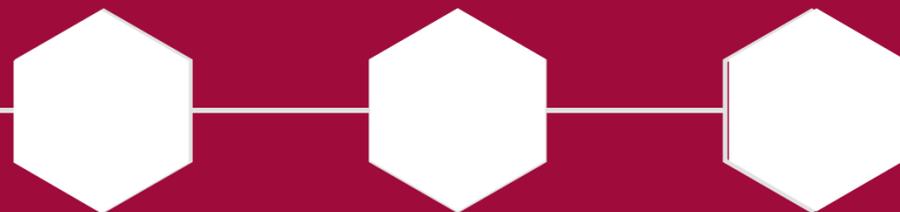




EARLY BUDDING

# ZINFANDEL / PRIMITIVO

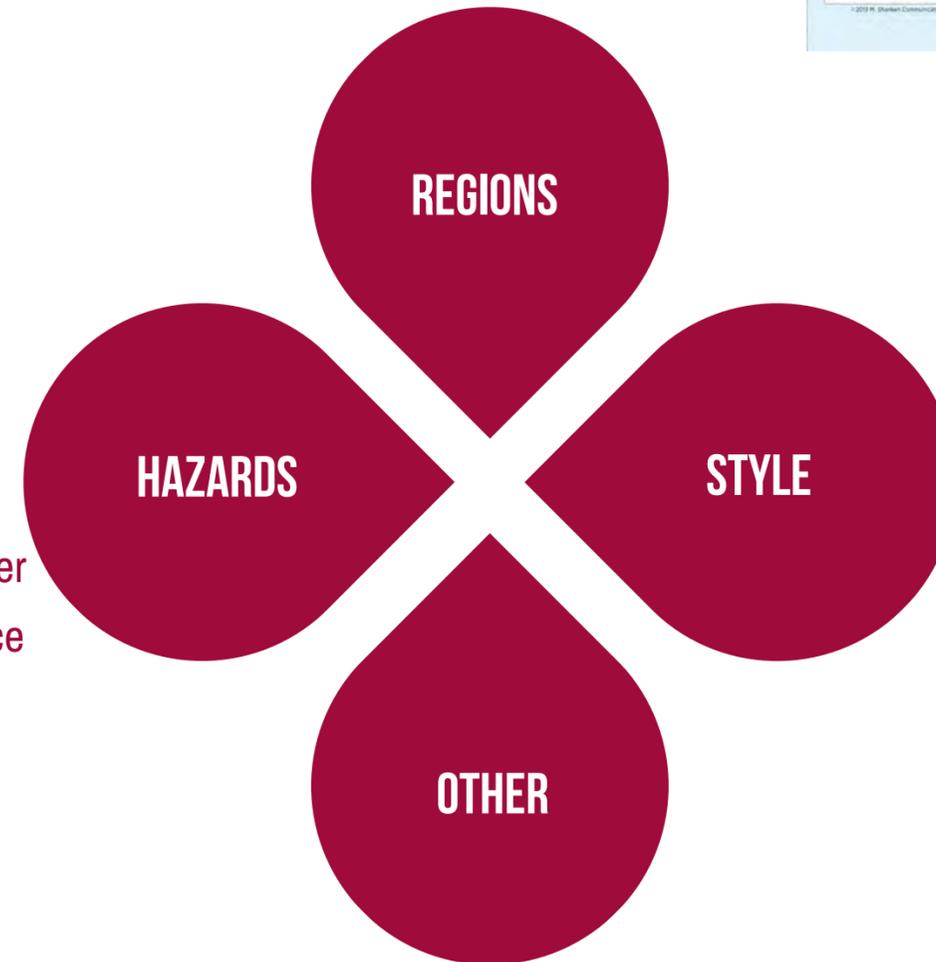
EARLY TO LATE RIPENING



- Puglia, IT 'Primitivo'
  - Primitivo di Manduria DOC: min 85% Primitivo
  - Gioia del Colle DOC: 50/60% of blend
- California, USA 'Zinfandel'
  - inland AVAs, e.g. Dry Creek Valley, Redwood Valley, Alexander Valley, Knights Valley, Lodi, ...



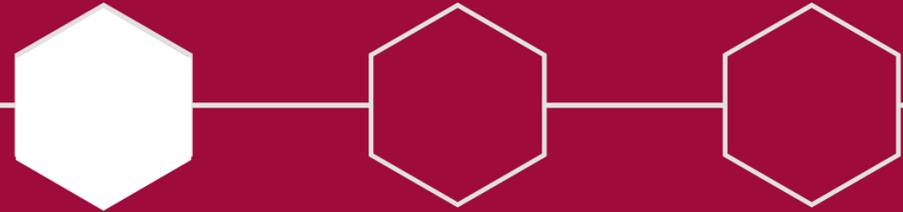
- spring frosts
- drought
- poor flowering and fruit set in rainy/humid years
- Puglia: looser bunches with smaller berries => more disease resistance than Zinfandel in California



- M+ to pronounced intensity
- ripe to jammy red cherry, strawberry, raspberry, blueberry, blackberry
- M to M+ acidity
- M to full body, high alcohol
- M to M+ ripe tannins
- all quality levels
- California: often American oak -> overt vanilla flavours
- also: White Zin: M pink colour, often M dry with low alcohol (10.5 - 11%)

- prone to uneven ripening (some grapes extra ripe as others just become ripe) -> challenging for growers
- strict sorting needed for high quality -> adds cost
- accumulates sugar easily => high alcohol wines
- Zinfandel/Tribidrag/Primitivo: genetically identical, but differences in vigour, bunch & grape sizes, ripening: PRIM ripens early in Puglia





EARLY BUDDING

# MERLOT

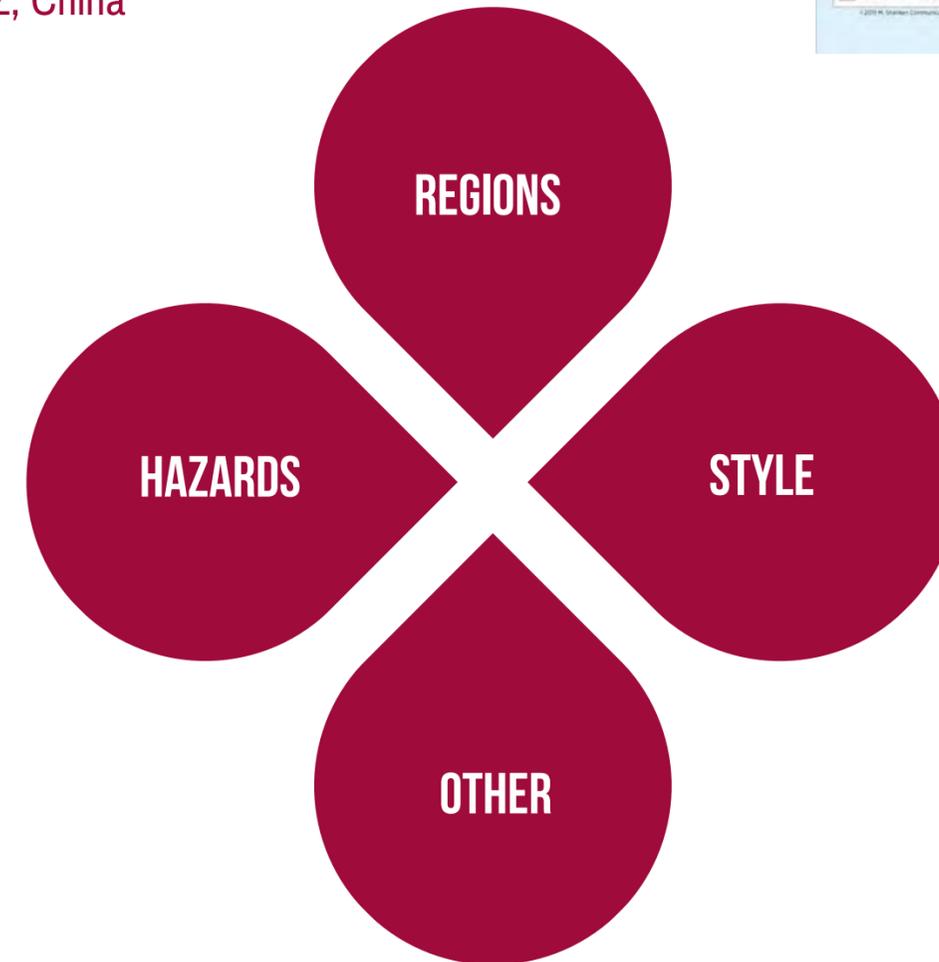
MID RIPENING



- FR: Bordeaux, Rhône Valley, South-West, Languedoc
- Germany, Greece, NE Italy, Central Italy, Spain
- USA: California, Oregon, Wash & NY State
- Canada, Chile, Argentina, South Africa, Australia, NZ, China



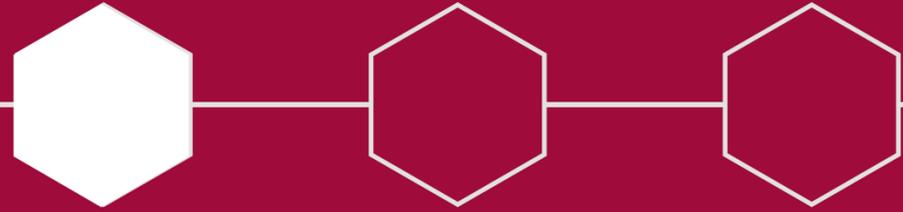
- spring frosts
- coulure
- millerandage
- drought
- botrytis bunch rot



- wide range of styles
- M to pronounced intensity
- from strawberry & red plum to riper, black fruits
- cooler: herbaceous
- warmer: cooked blackberry & black plum
- M tannins
- M to high alcohol

- ripens on cooler sites in Bdx (location & clay soils)
- large berry size (on water-holding soils)
- higher sugar levels => higher potential alcohol > Cabernets

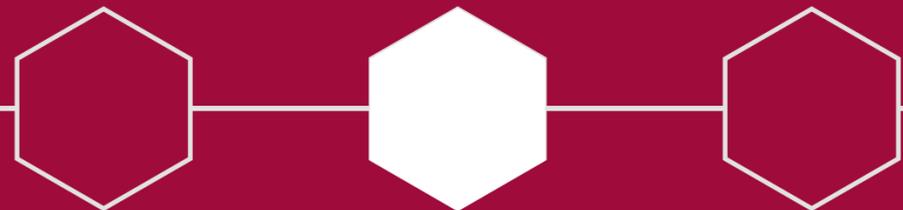




EARLY BUDDING

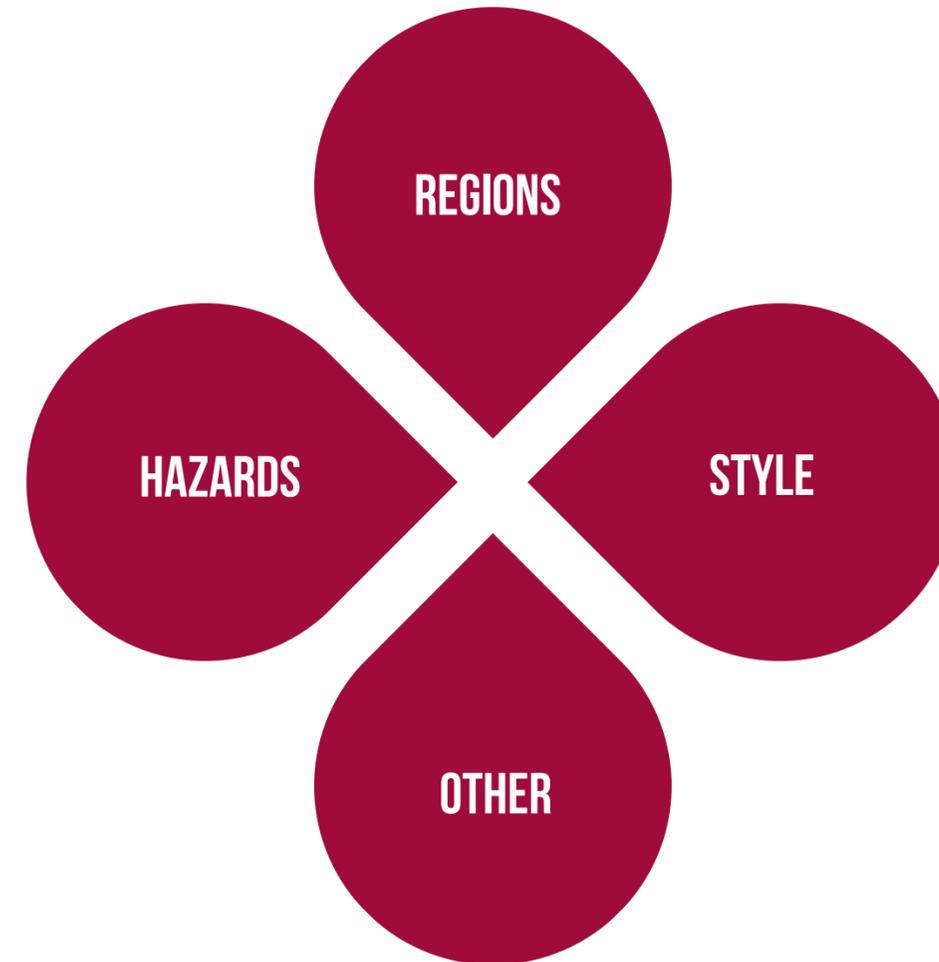
# CABERNET FRANC

MID RIPENING



- resilient against winter freeze
- spring frosts (early budding)
- coulure -> reduced yields

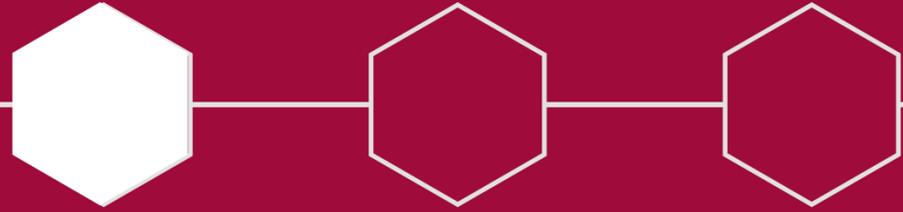
- FR: Bordeaux, Loire, Languedoc, SouthWest
- IT: NE, Central
- USA: California, Finger Lakes.
- Canada: Ontario
- Argentina (e.g. Patagonia)
- New Zealand, i.a. Hawke's Bay



- M to pronounced intensity
- redcurrant, raspberry, floral (violet)
- if not fully ripe: excessively leafy
- light to M body
- M tannins
- high acidity

- cold hardy
- prone to reduced yields (coulure)
- in Loire Valley: usually single-varietal red wines or part of rosé blend. In E Touraine: blended with Cot)

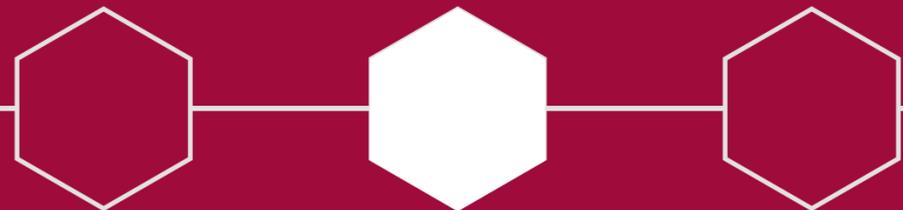




EARLY BUDDING

# MALBEC / COT

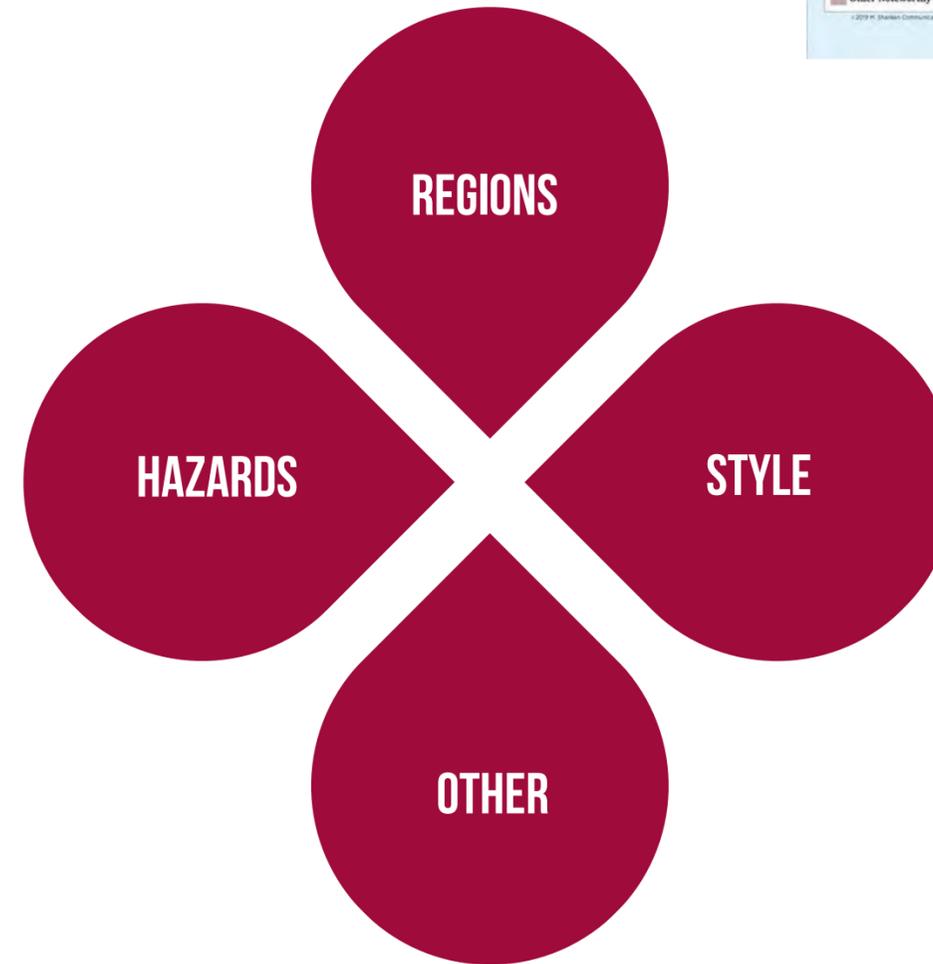
MID RIPENING



- FR: Bordeaux, South West (Cahors)
- Argentina



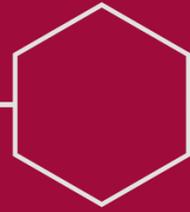
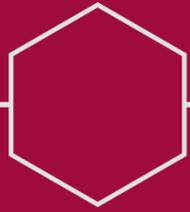
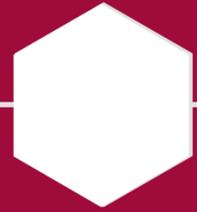
- coulure -> reduces yields



- deep ruby colour
- M to pronounced intensity
- violet, red & black plum, blackberry
- M to M+ acidity
- M+ to high tannins, ripeness ~ region
- from fruity, early-drinking styles
- to very good/outstanding (super)-premium
  - oak => vanilla & spice notes
  - ageworthy
- or foudres for slow oxidative development & no oak aromas

- vigorous => careful canopy management
- yield important to determine style
- in blends with Bordeaux varieties, or with Bonarda, Syrah, ...
- increasing understanding of microclimates => diverse styles

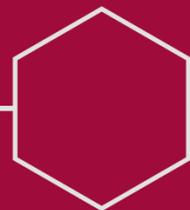
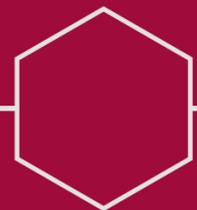




EARLY BUDDING

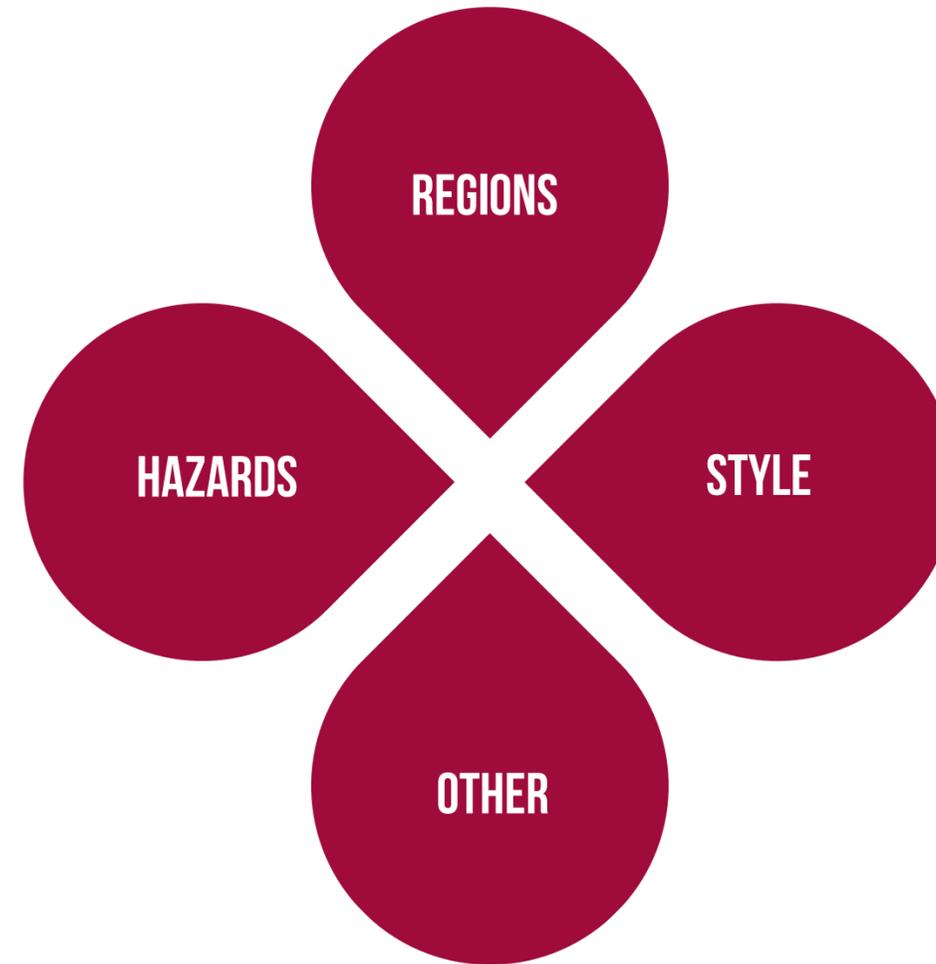
# ZWEIGELT

MID RIPENING



- Austria (most planted black variety: 14% of total area under vine)

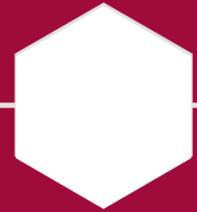
- potassium deficiency can lead to withering of grapes before ripening
- not susceptible to frost or rot



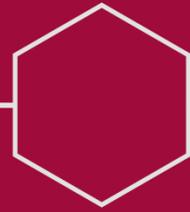
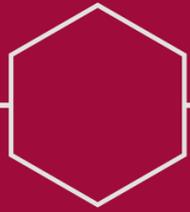
- red fruit, especially cherry
- M+ acidity
- M tannins
- from easy-drinking, fruity, unoaked
  - acceptable to good quality
  - inexpensive to mid-priced
- to full-bodied, oaked styles
  - ageing potential
  - very good quality
  - can command premium prices

- crossing between Sankt Laurent & Blaufränkisch
- ripens earlier/more easily > Blaufränkisch
- can be high yielding
- vigorous -> careful canopy management, leaf removal, ...



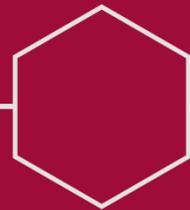
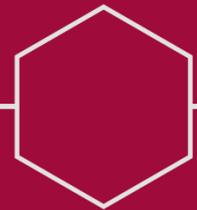


EARLY BUDDING



# SCHIAVA / VERNATSCH

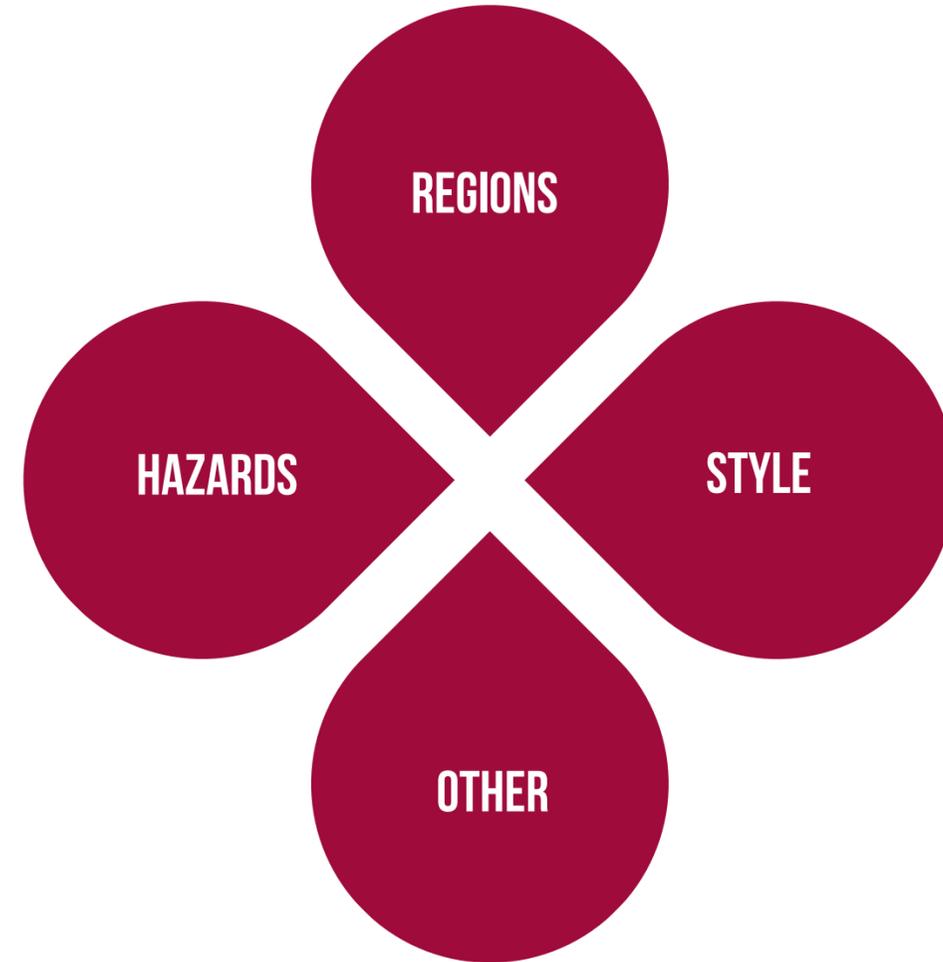
MID RIPENING



wine & words

- Alto Adige, IT (most planted grape)
  - e.g. Santa Magdalena DOC
- Trentino, IT
- Germany: 'Vernatsch', 'Trollinger' (Württemberg)

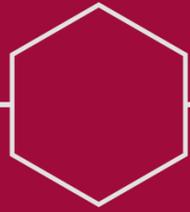
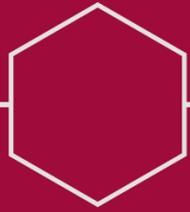
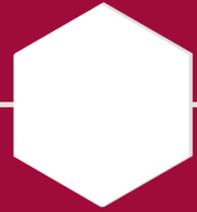
- very winter frost resistant



- pale ruby
- perfumed violet / strawberry
- M to light body
- low tannins
- darker & fuller-bodied in Santa Magdalena DOC (blended with up to 15% Lagrein)

- 4 separate varieties have been identified -> usually grown/vinified together:
  - Schiava Gentile
  - Schiava Grigia
  - **Schiava Grossa**: most common in Alto Adige; = Trollinger in DE
  - Schiava Lombarda
- typically grown on pergola to cope with high natural vigour

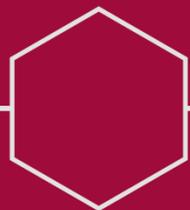
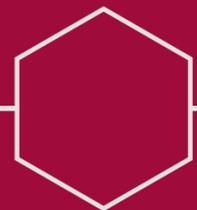




EARLY BUDDING

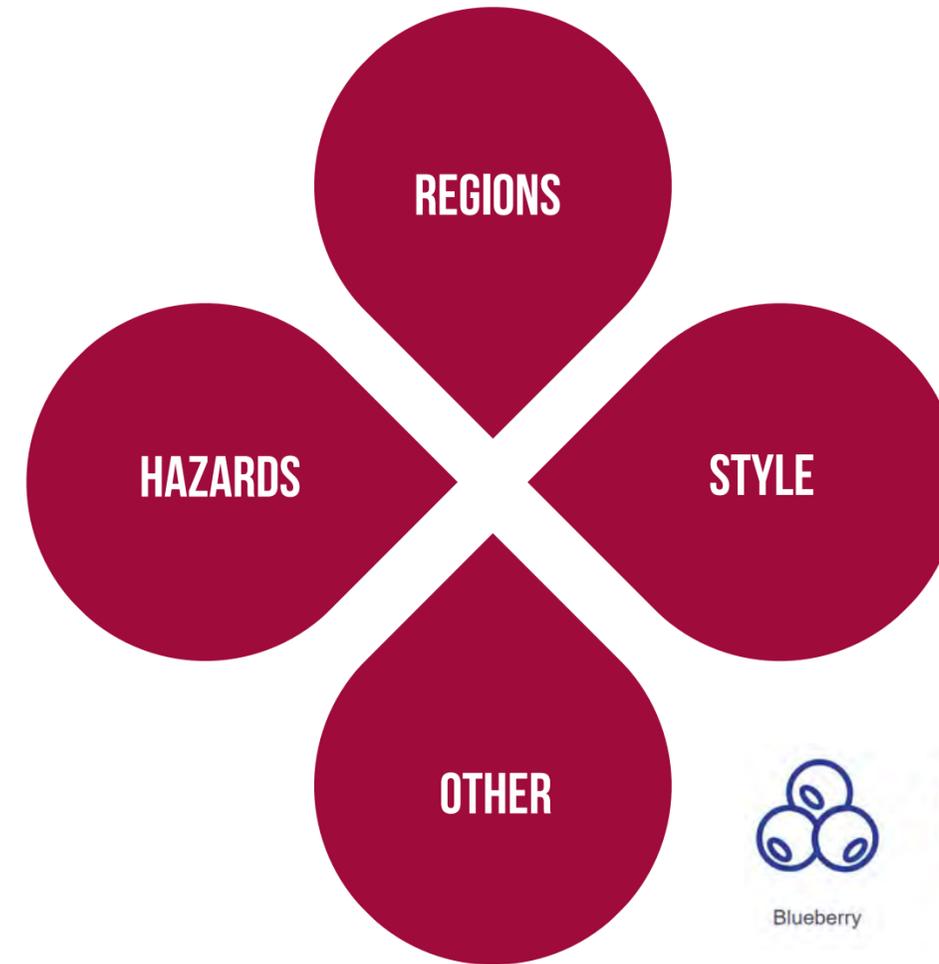
# TOURIGA NACIONAL

MID RIPENING



- Portugal: Douro, Dão, Alentejo, Tejo

- coulure



- deep colour
- high acidity
- high tannins
- black fruit flavours
- floral: violet, rose, orange blossom
- herbal notes



Blueberry



Violet



Plum

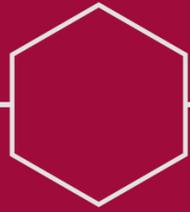
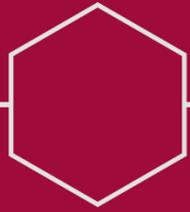
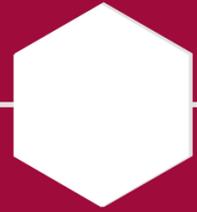


Mint



Wet Slate

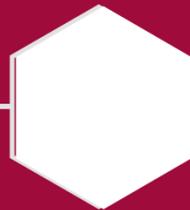
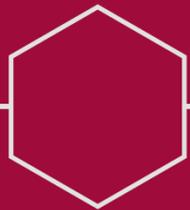
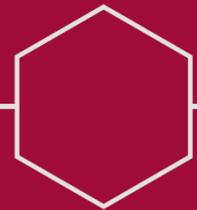
- retains acidity fairly well
- high vigour



EARLY BUDDING

# GRENACHE N / GARNACHA

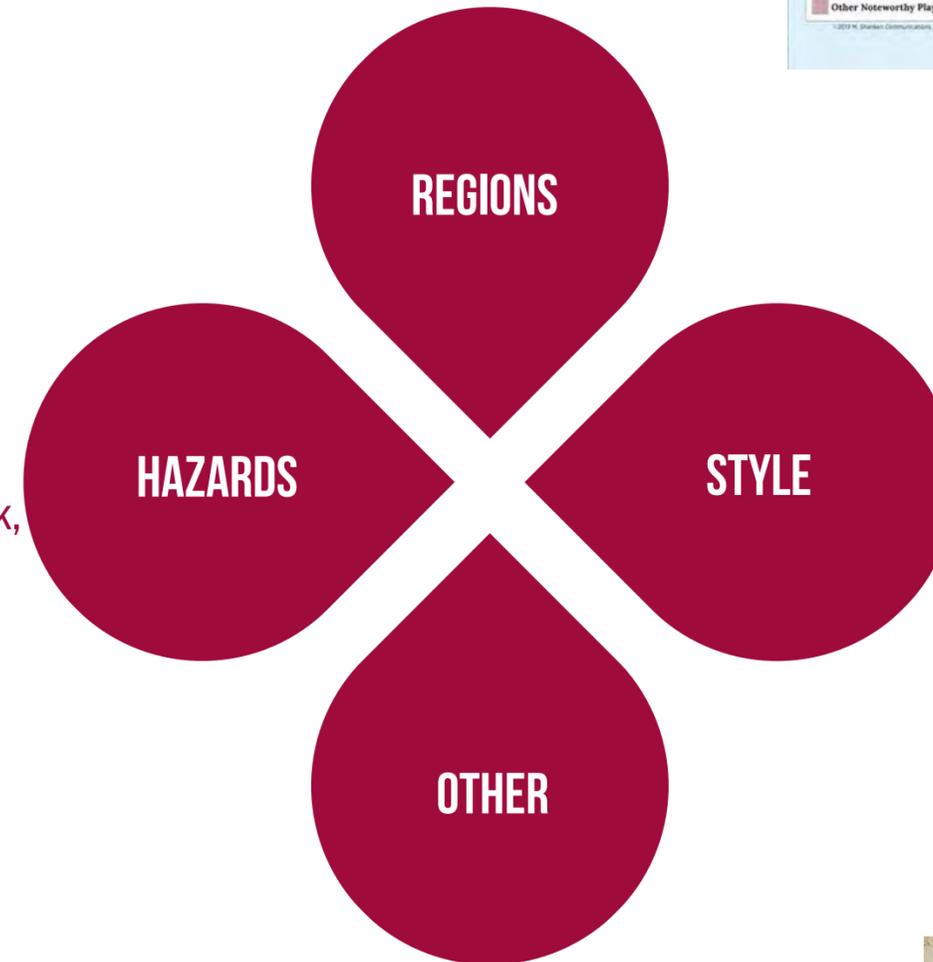
LATE RIPENING



- FR: S. Rhône, Languedoc, Roussillon, Provence
- IT: Cannonau di Sardegna DOC
- ES: Catalunya (Priorat DOQ, Montsant DO); Rioja DOCa (esp. Oriental); Navarra (+ rosé); Aragon; Sierra de Gredos
- AUS: McLaren Vale, Eden, Barossa



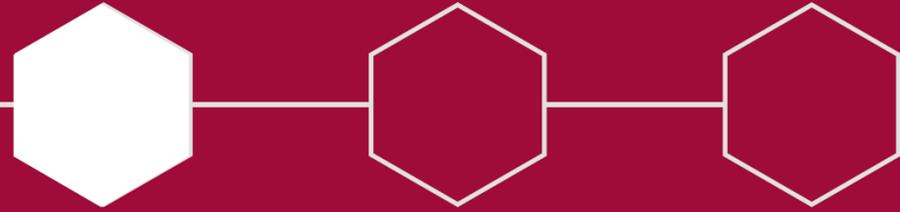
- coulure => reduced yields
- fungal diseases: downy mildew, botrytis bunch rot, eutypa dieback, phomopsis cane & leaf spot
- bacterial necrosis/blight
- early autumn rains (ripens late)



- pale ruby colour
- ripe strawberry, red cherry/plum
- spicy and herbal notes
- high alcohol
- low to M tannins
- low to M acidity (M+ in some regions)

- drought tolerant -> good in dry climates
- needs warm climate to ripen
- high-yielding grape variety
- does well on dry, low fertility soils
- upright growth -> very suitable as bush vine
- can accumulate high sugar lvls quickly => very suitable for VDNs

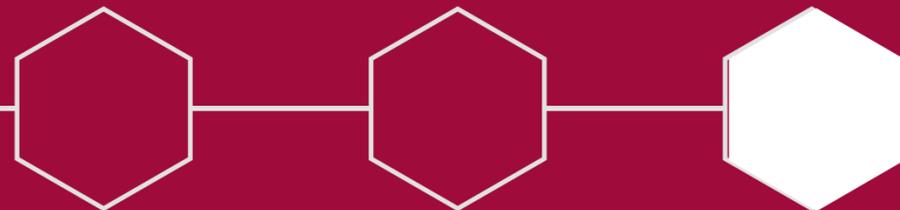




EARLY BUDDING

# NEBBIOLO

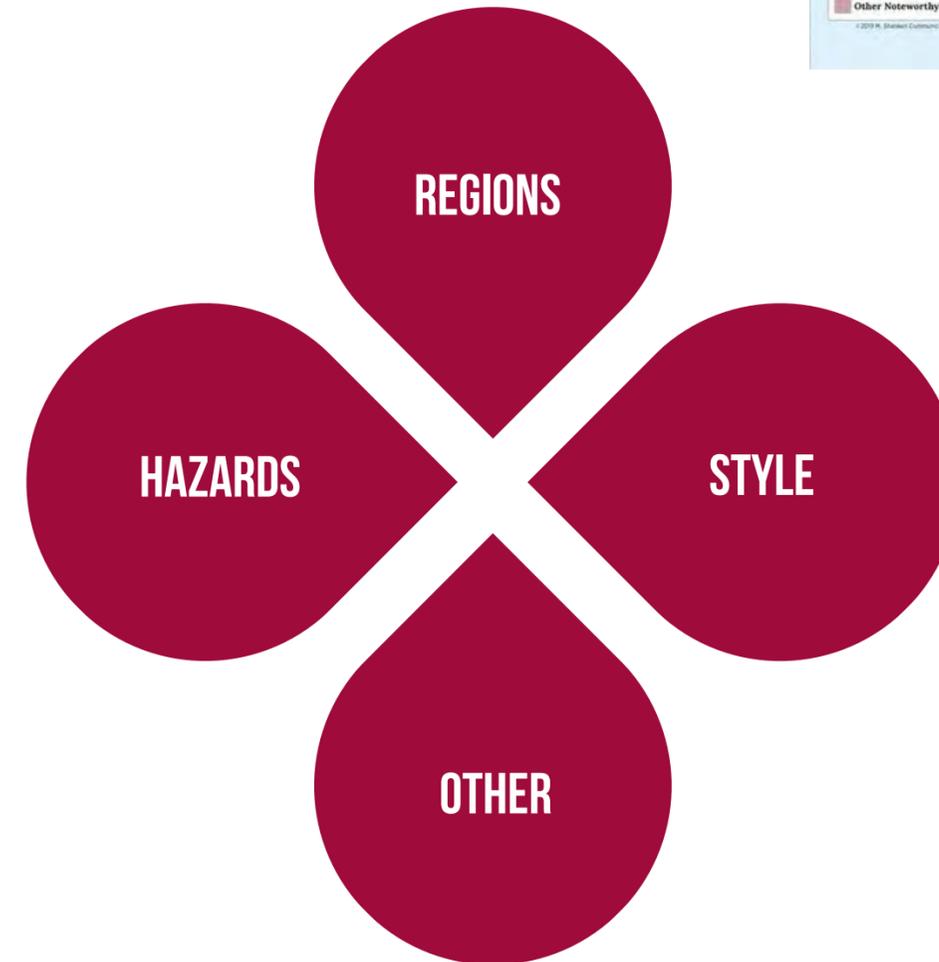
LATE RIPENING



- Piemonte, IT
  - mainly Cuneo province / Langhe
  - also in northern provinces
- AUS:
  - South Australia: Adelaide Hills
  - North East Victoria: King Valley



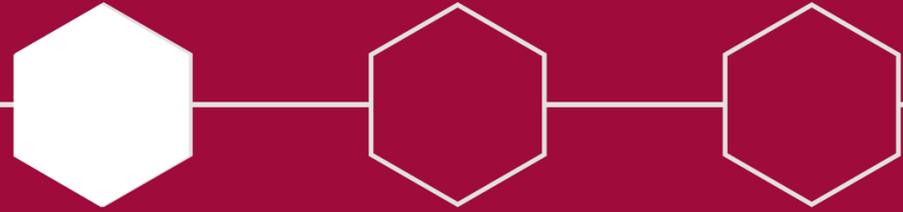
- spring frosts



- pale ruby colour
  - turning to pale garnet in 3-5 y
- pronounced intensity
  - violet, rose, red cherry, red plum
- high acidity
- high tannins
- full body
- can be high alcohol

- vigorous variety => canopy management & cluster thinning
- very fussy about soils; said to produce finest, most perfumed wines on calcareous marls, e.g. N & S of Alba
- valuable in market => usually best S/SW-facing sites
- first few buds: infertile -> pruned high
- usually: single Guyot (facilitates mechanical trimming)

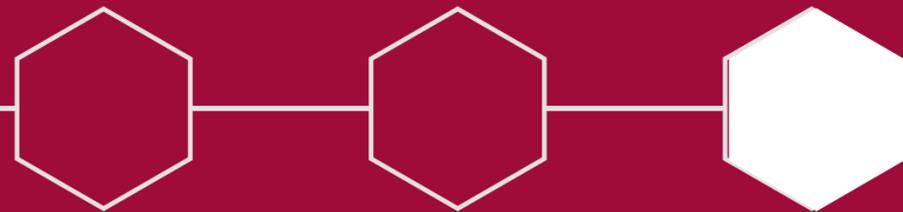




EARLY BUDDING

# BARBERA

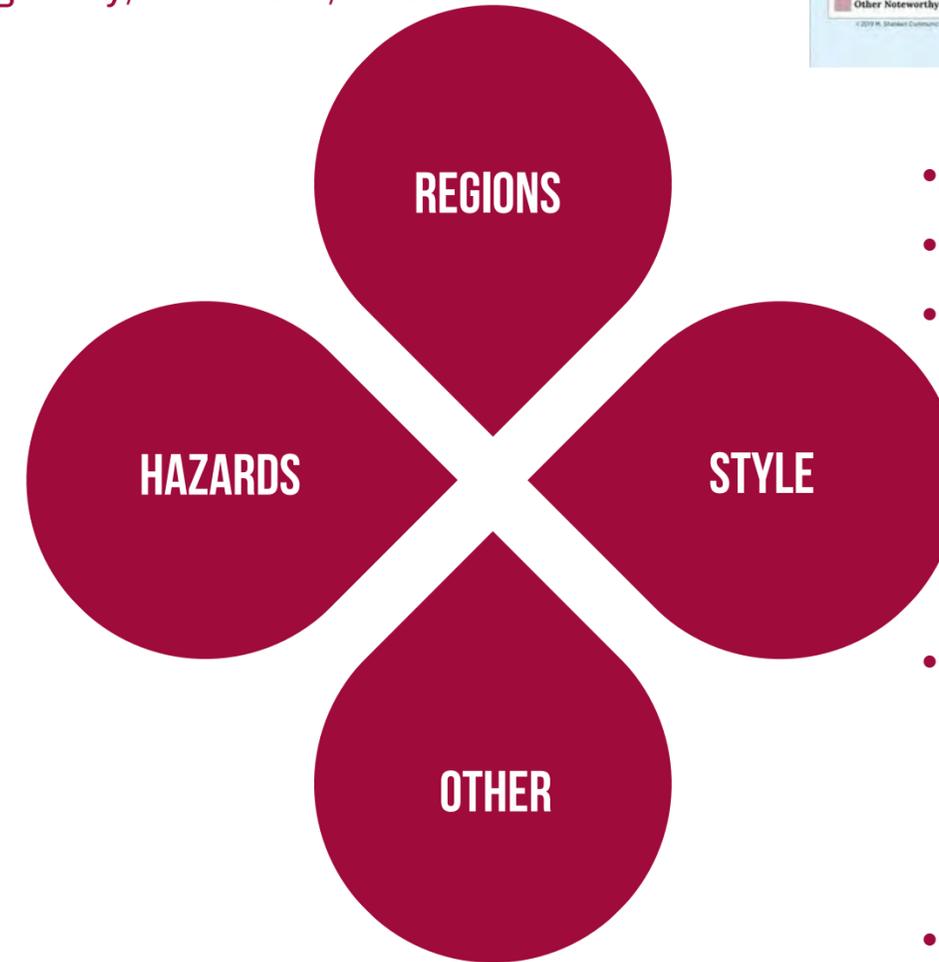
LATE RIPENING



- IT:
  - most planted variety in Piemonte (3x vvd area of Nebbiolo) -> especially Asti, Alba, Monferrato
  - in Campania for local consumption / bulk wine
- California, USA: Lodi, Sierra Foothills
- King Valley, NE Victoria, AUS



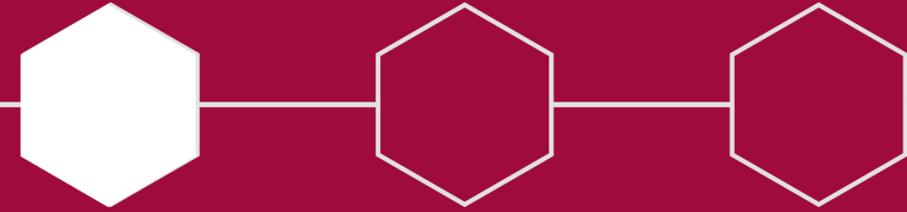
- spring frosts
- disease resistant
- fan leaf virus



- M to deep ruby colour
- high acidity, M alcohol
- inexpensive to mid priced:
  - M intensity red plum, red cherry
  - sometimes black pepper
- M tannin
- good to very good
- some premium (old vines, lower Y)
  - highly concentrated, ageworthy
  - aged in Fr. oak -> oak tannins
  - very good to outstanding
- range of styles, incl. lightly sparkling

- Ripens relatively late but earlier than Nebbiolo
- very vigorous and disease resistant
  - can produce very high yields -> acceptable to good
  - or be pruned hard -> highly concentrated wines
- best quality from Asti and its sub-zones, incl. Nizza DOCG

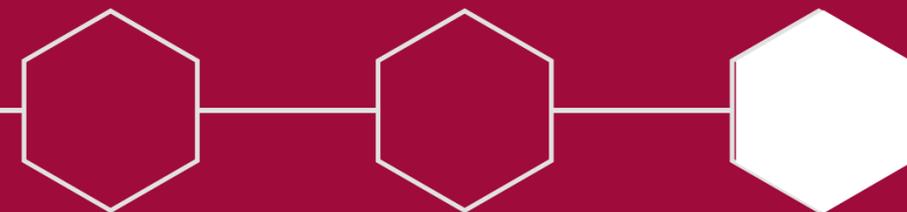




EARLY BUDDING

# SANGIOVESE

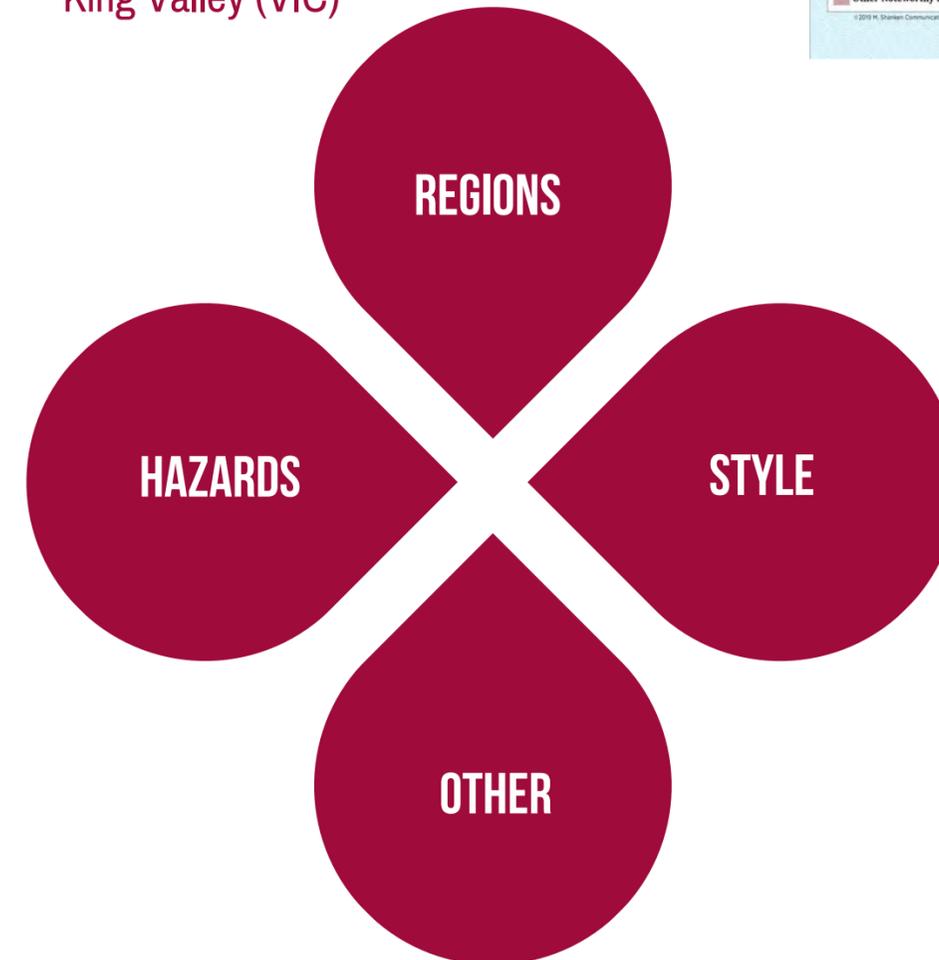
LATE RIPENING



- Italy: 10% of all plantings
  - Tuscany: dominant variety
  - Central (e.g. Marche) and S. Italy
- Sierra Foothills, California, USA
- AUS: Adelaide Hills, McLaren Vale (SA), King Valley (VIC)



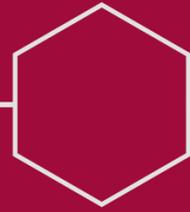
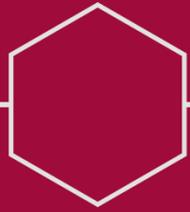
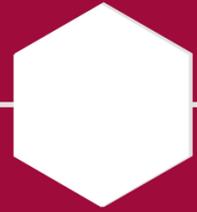
- spring frosts
- esca
- wild boar
- autumn rain



- M ruby colour
- red cherry, red plum, herbal
- high acidity
- M to full bodied
- high tannins
- all price and quality levels
- blends in Chianti:
  - up to 10% of white grapes allowed (rarely used)
  - with Canaiolo Nero (red fruits, floral notes, light tannins)
  - also: CS, CF, ME, SY

- different names in Tuscany: Morellino (di Scansano); Prugnolo Gentile (Montepulciano)
- difficult variety to grow
  - best on sunny S/SE-facing slopes: best chance to ripen
  - best on 200-550m altitude -> longer season => better chance at ripeness
- best on friable, shale and limestone soils (drainage), ok on clay

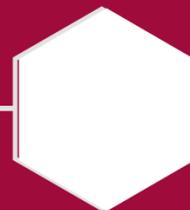
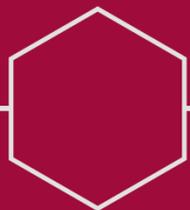
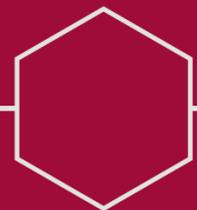




EARLY BUDDING

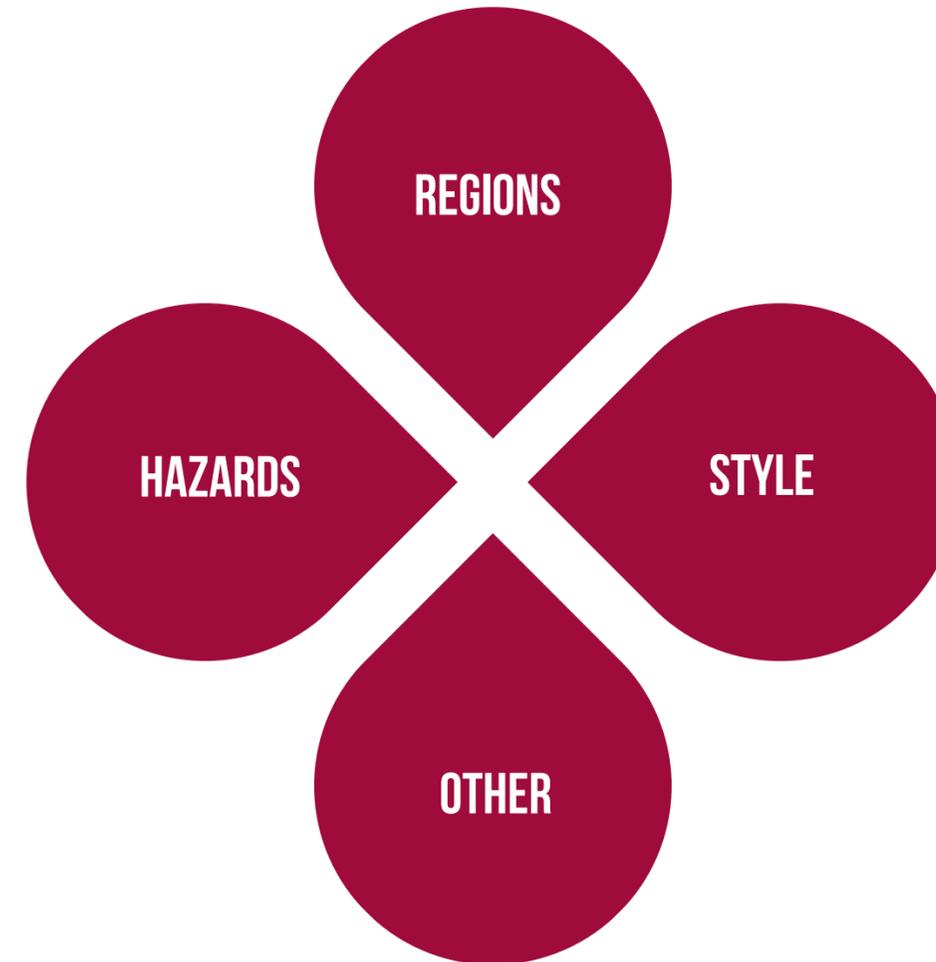
# AGLIANICO

LATE RIPENING



- Campania, IT: Taurasi DOCG: min 85% Aglianico
  - min. 3 years aging (min 1 in wood); Riserva: min. 4y (min 18m in wood)
- Basilicata, IT: Aglianico del Vulture DOC
  - 100% Aglianico, 1 year of ageing
- USA: California: Lodi AVA, Sierra Foothills AVA

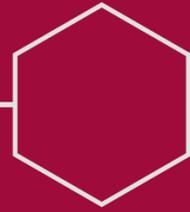
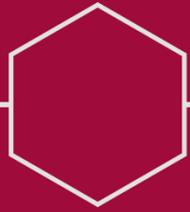
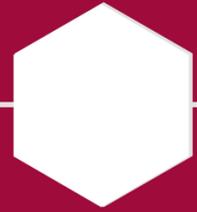
- spring frosts
- botrytis bunch rot (late-season rains)



- M+ to pronounced intensity
- rose, red plum, blackberry
- high acidity
- high tannins -> softened by:
  - ageing in high Q small oak
  - large traditional oak casks
  - bottle age
- very good to outstanding
- mid to premium priced

- requires long season for tannins to ripen
  - vigorous variety -> yields controlled for quality
  - name ~ 'Hellenic' but probably not Greek, but rather from S. Italy
  - high Q wines on cool slopes (200-600m) in Campania
- > long season => more intense flavours

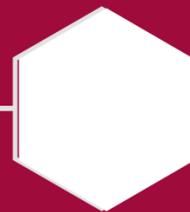
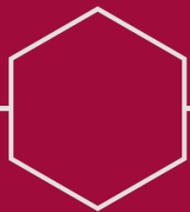
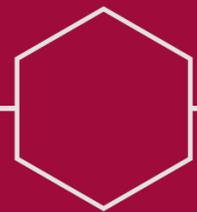




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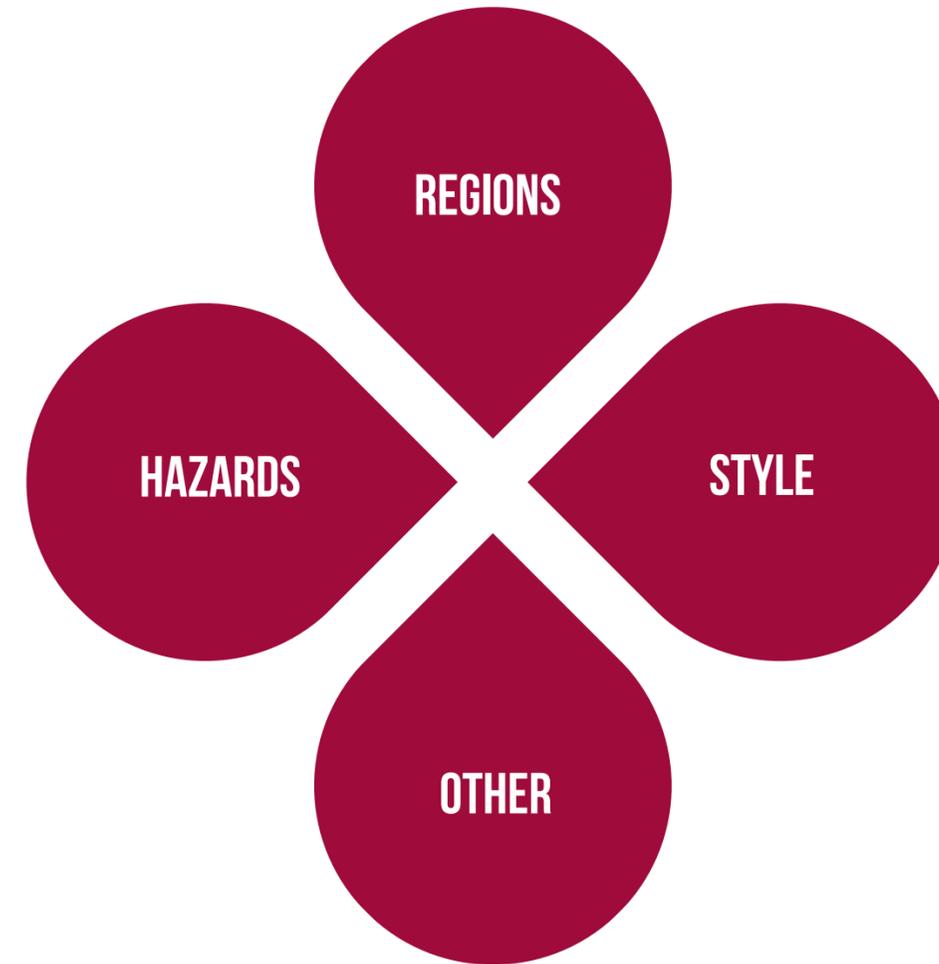
# REFOSCO

LATE RIPENING



- most planted black variety in Friuli, IT

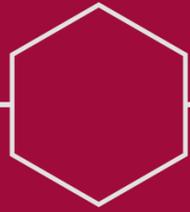
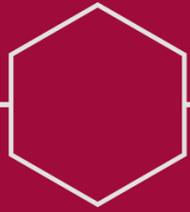
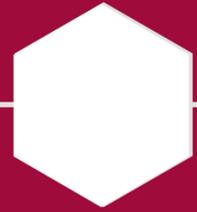
- resistant to botrytis



- red cherry, herbal
- high tannins (small berries)
  - smoothed out by barrel ageing

- 'Refosco dal Peduncolo Rosso'
- vigorous variety => best wines from hillsides with lower fertility
- small berries -> high tannins

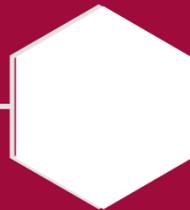
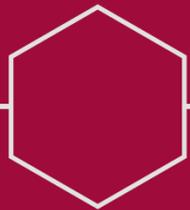
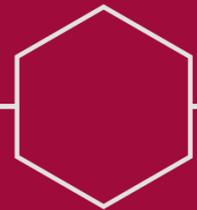




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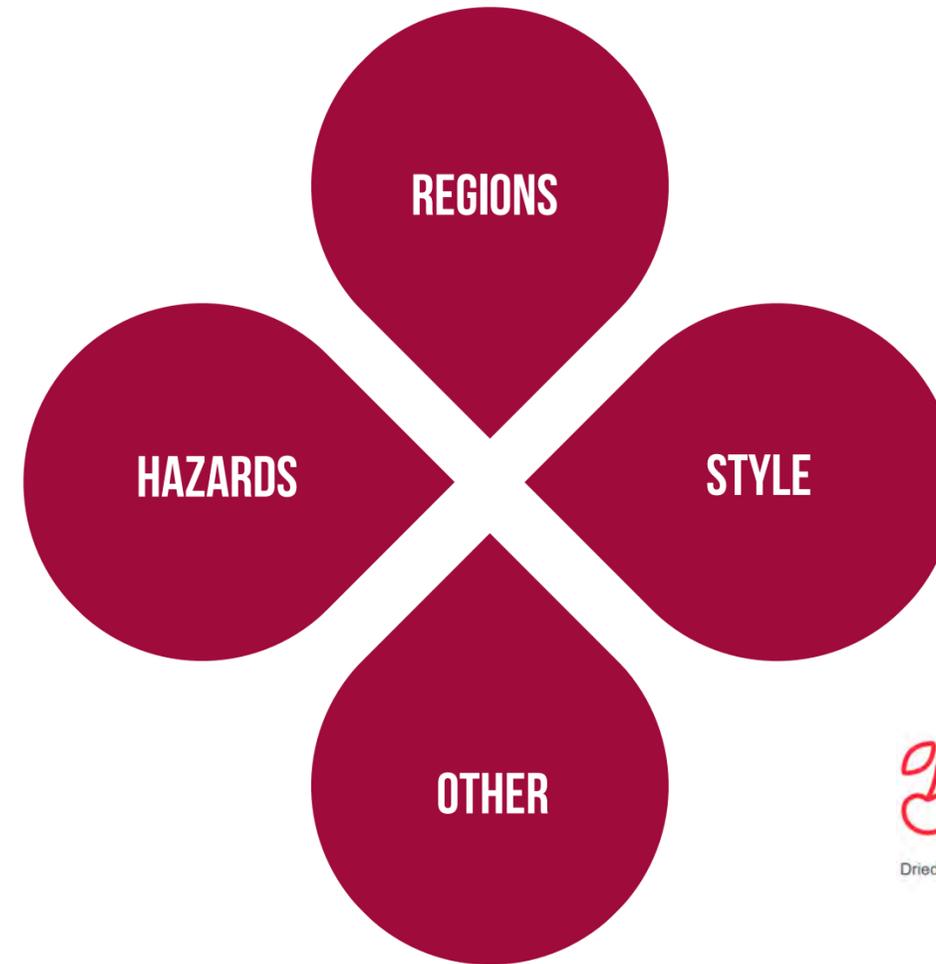
# NERELLO MASCALESE

LATE RIPENING



- spring frost
- coulure -> varying annual yields
- powdery mildew
- botrytis bunch rot
- autumn rain

- Sicily, IT
  - Etna Rosso DOC: min 80% Nerello Mascalese (rest: Nerello Cappuccio: adds colour and red berry fruit)
    - Riserva: min. 4y ageing, of which 1y in wood



- M to pale ruby colour
- pronounced intensity
- red cherry, violet, herbal earth notes
- high acidity
- M to high tannins
- high end of M alcohol



Dried Cherry



Orange Zest



Dried Thyme

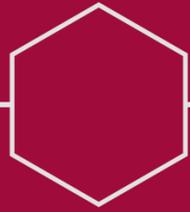
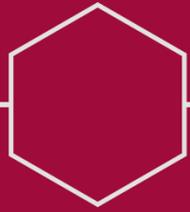
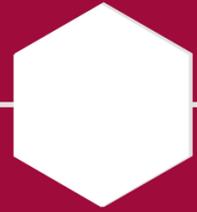


Allspice



Crushed Gravel

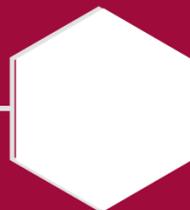
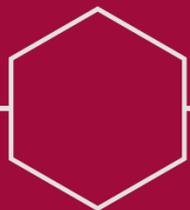
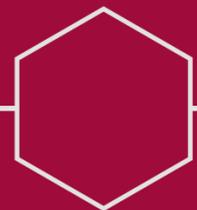
- grown for high-volume production across Sicily -> often at high yields
- last 2 decades: wines from Etna: highly regarded
- Etna: altitude 400-1000m => very long growing season => intense flavours
- in cooler sites on Etna: deleaf around fruit zones for ripeness, but not too early (avoid sunburn)
- moderately high tannic variety => avoid overextraction of tannins



EARLY BUDDING

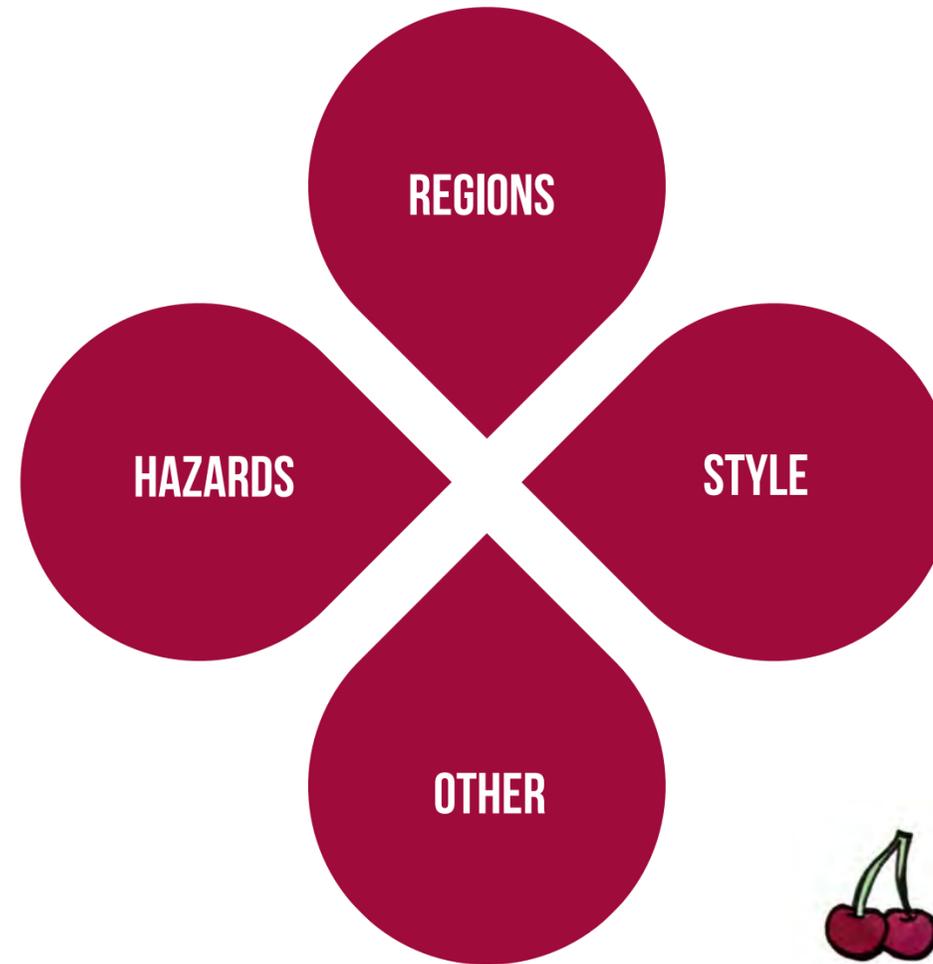
# PETIT VERDOT

LATE RIPENING



- FR: Bordeaux (best in warmer parts of Médoc)
- IT: Tuscany: Bolgheri DOC (up to 30% allowed)
- ES: Jumilla, Castilla-La Mancha. PT: Alentejo
- USA: California (Alexander Valley AVA, Rockpile AVA, Napa)
- Argentina; SE Australia

- spring frosts
- thick skins => high resistance to e.g. grey rot
- failure to ripen in cool years
- rain at harvest



- powerful, deeply coloured wines
- high tannins
- spice notes

- thick-skinned
- ripens even later than CabSauv
- very few plantings but increasingly appreciated -> can ripen in warmer climate



BLACK CHERRY



PLUM



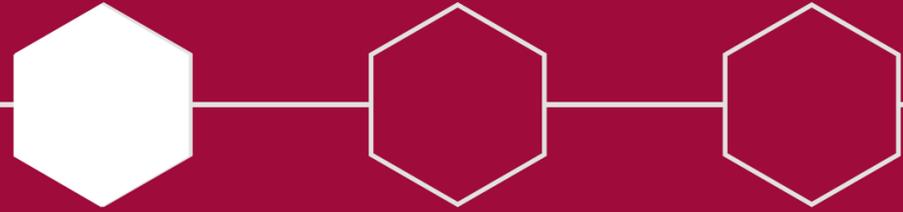
VIOLET



LILAC



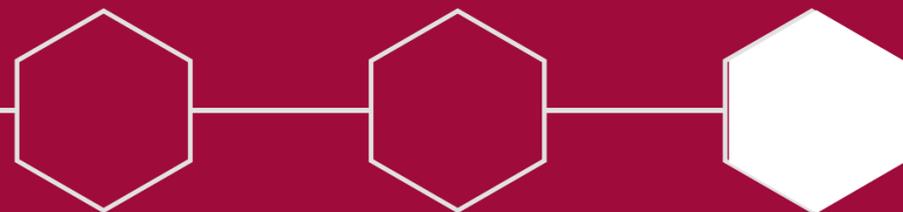
SAGE



EARLY BUDDING

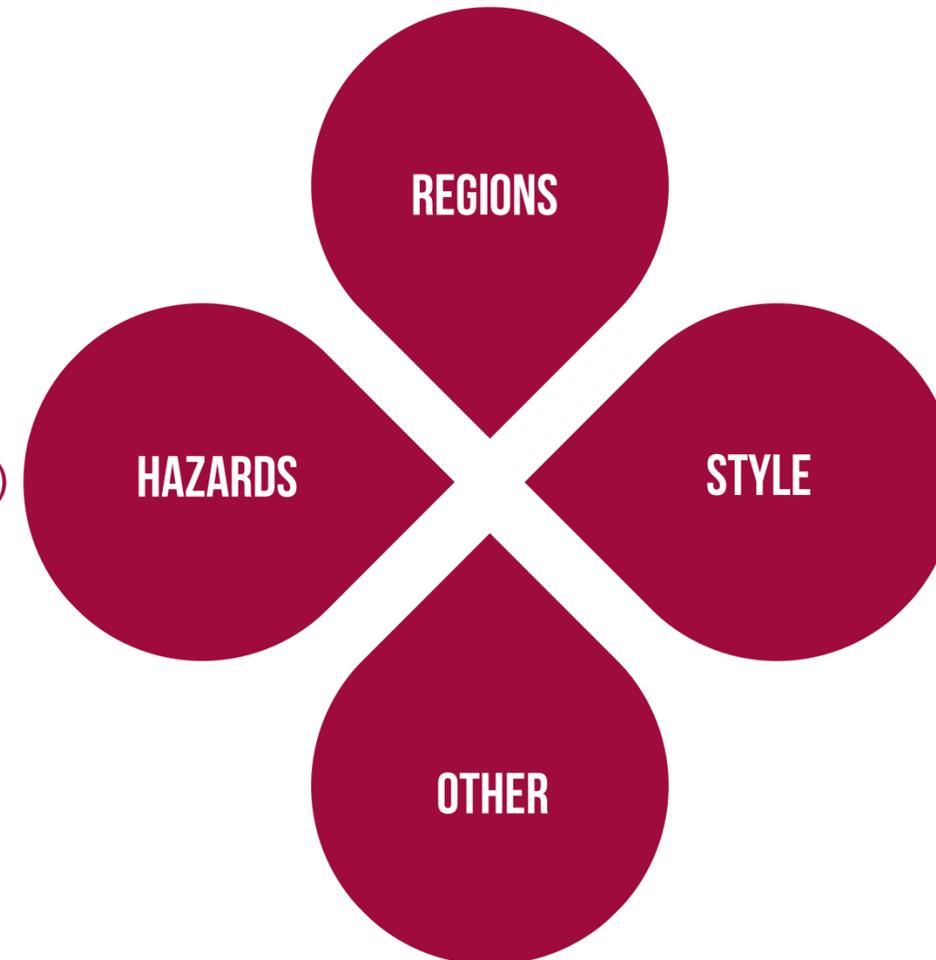
# BLAUFRÄNKISCH

LATE RIPENING



- Austria (2nd most planted black variety)
  - prime locations: Leithaberg DAC & Mittelburgenland DAC

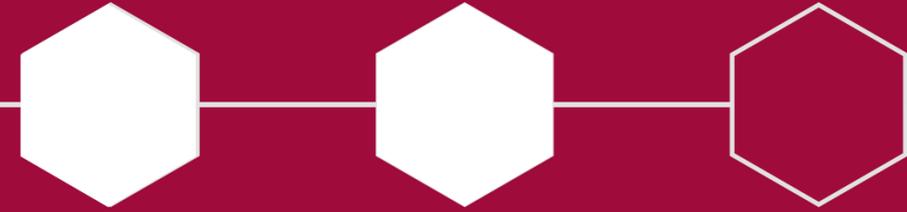
- spring frosts
- not very prone to rot (thick skins)



- M+ to high tannins
- high acidity
- from simple, fruity, little or no oak
  - good quality, mid-priced
- to very good to outstanding wines
  - deep colour
  - pronounced black fruit
  - spicy oak characters
  - high tannins
- premium priced

- needs warm climate to become fully ripe
- thick-skinned variety -> not as prone to rot as some other varieties -> important in humid area around Neusiedlersee
- can produce high yields & then struggle to ripen => when yields are managed: some of Austria's most intense and ageworthy red wines

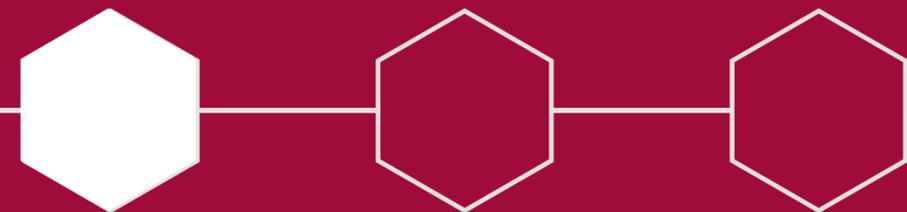




EARLY TO MID BUDDING

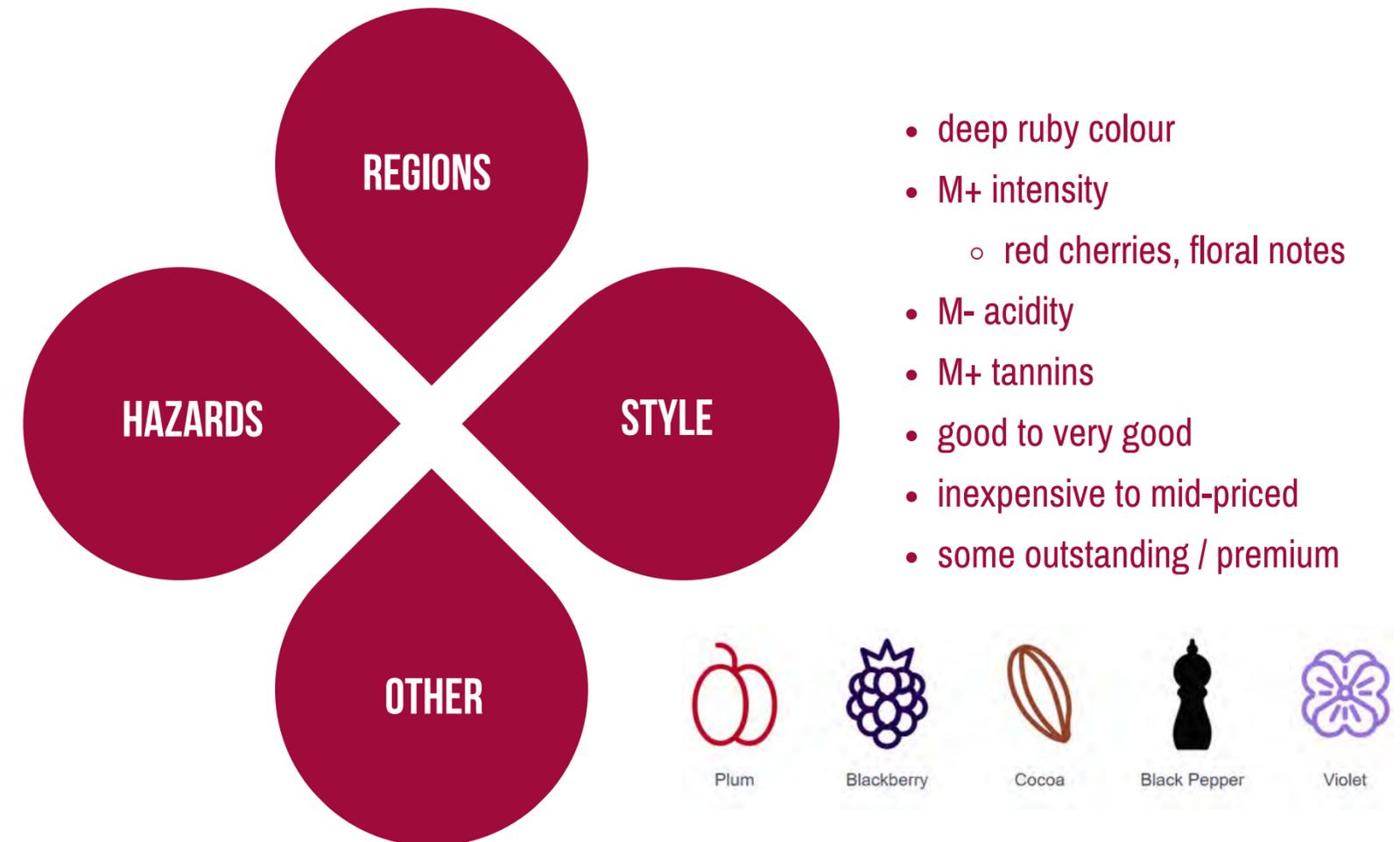
# DOLCETTO

EARLY RIPENING



- fungal diseases
- fragile (buds are easily broken)
- ripening can be blocked by long spells of cold weather

- Piemonte, IT -> best areas:
  - Alba: Dolcetto d'Alba DOC
  - Ovada: Dolcetto di Ovada DOC
  - Dogliani: Dogliani DOCG



- ripens early -> can be grown on cooler sites > Nebbiolo & Barbera
- low vigour
- reductive in winery => frequent pump overs or rack-and-return to introduce oxygen / avoid off-flavours
- to retain fresh primary fruit:
  - mid-range fermentation t°; stainless steel tanks or cement vats
  - short time on skins (7-15 days) + soft extraction methods (avoid harsh tannins)

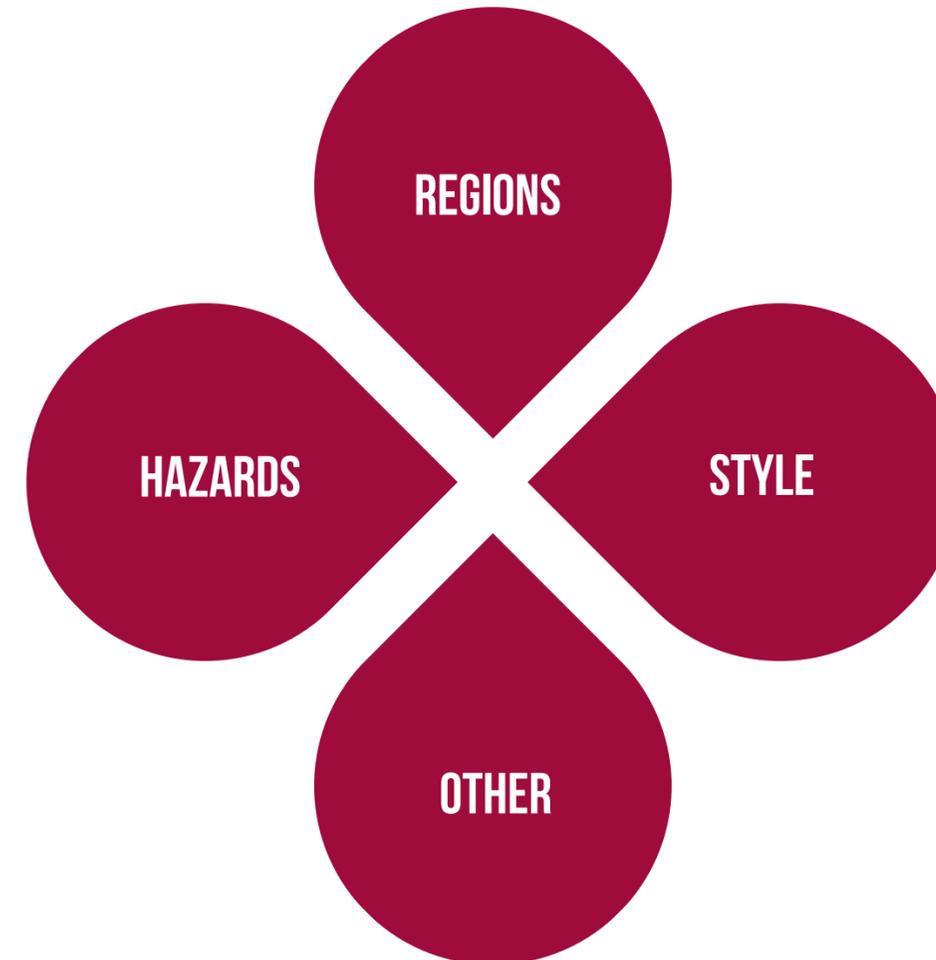
EARLY TO MID BUDDING

# DORNFELDER

EARLY TO MID RIPENING

- Germany, especially Rheinhessen and Pfalz

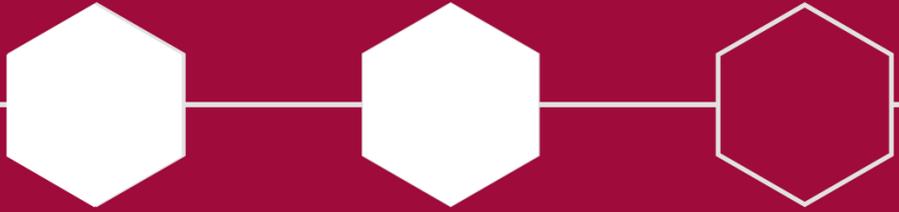
- thick skins => good resistance to botrytis bunch rot



- deep colour
- high acidity
- fruity and floral notes
- 2 distinct styles:
  - fruity, easy-drinking, sometimes residual sugar, sour cherry & blackberry
  - more complex and ageworthy from lower yields, more tannins and structure, fermented or aged in oak

- most significant of the black German crosses
- in past 30 years: from nothing to Germany's 2nd most planted black variety
- 2 distinct styles: fruity/easy-drinking and complex/ageworthy

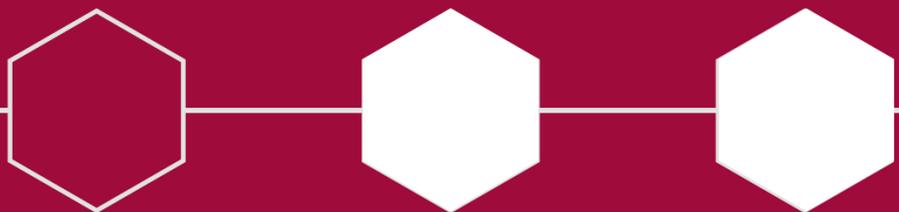




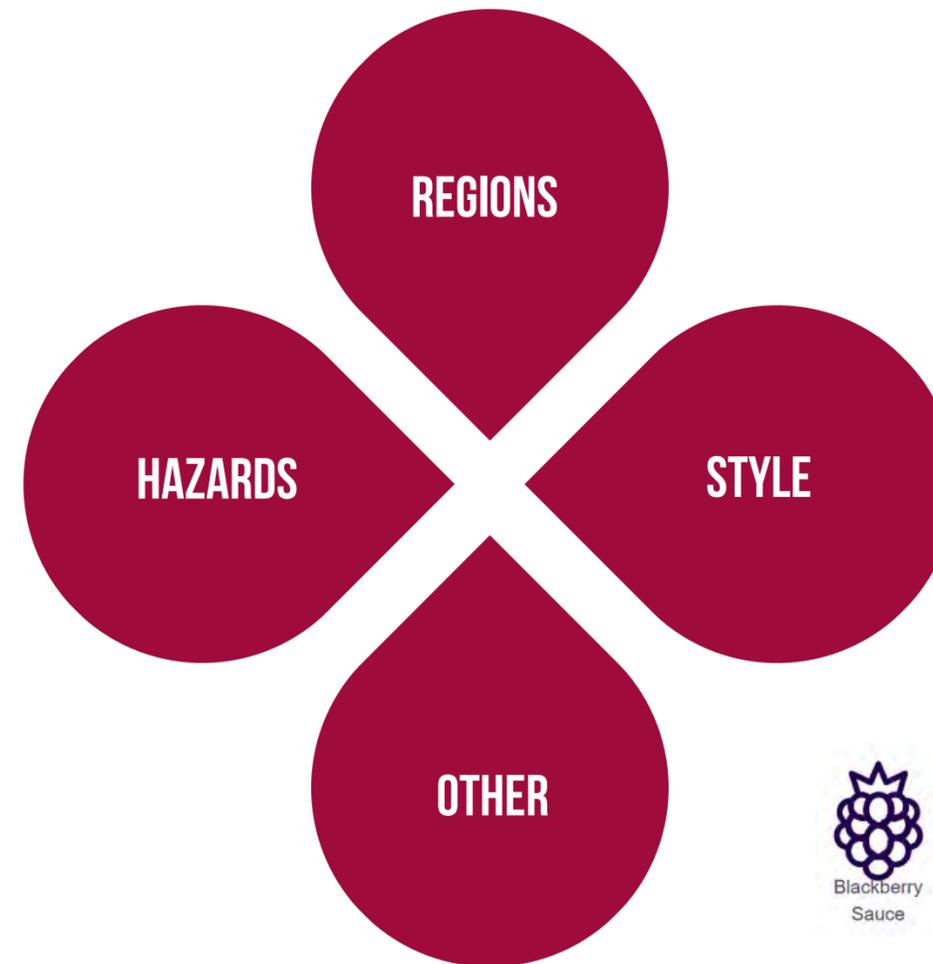
EARLY TO MID BUDDING

# TOURIGA FRANCA

MID TO LATE RIPENING



- Portugal: Douro



- red & black fruits
- floral character
- M body
- M alcohol



- retains acidity fairly well

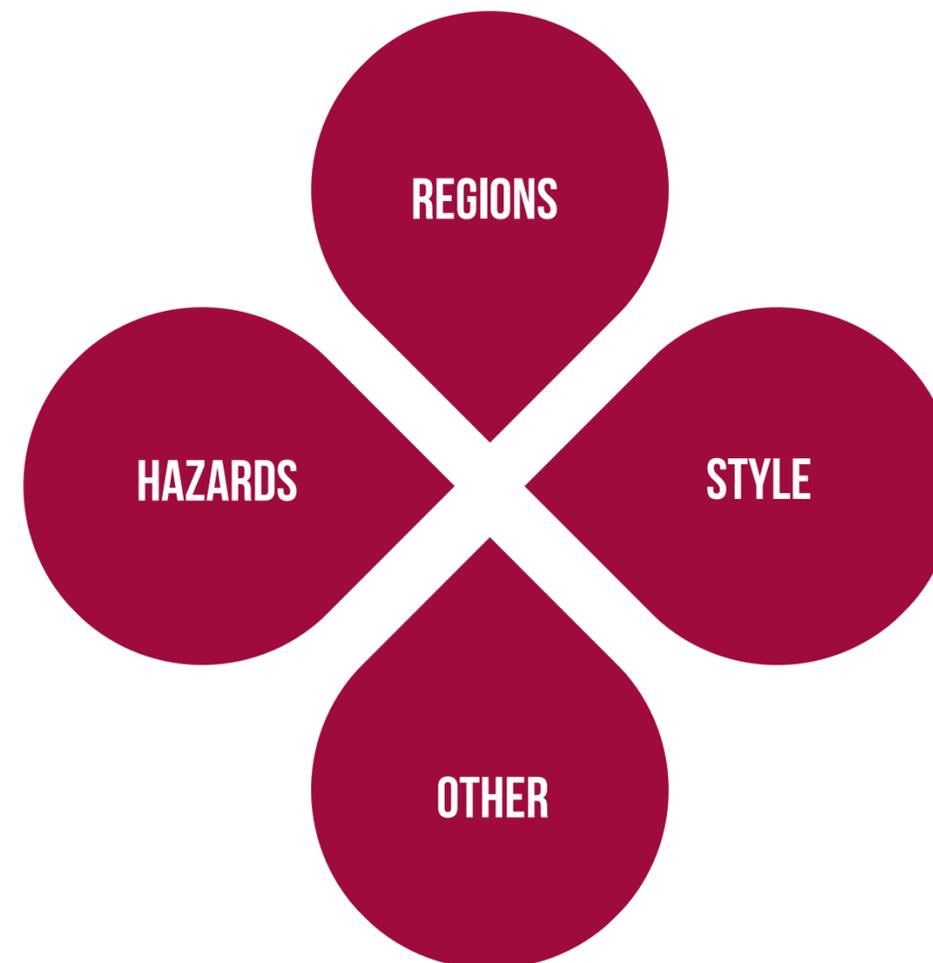
EARLY TO MID BUDDING

# PIEDIROSSO

LATE RIPENING

- adapted to heat and drought
- botrytis resistant (open bunches, thick-skinned berries)

- Campania, IT -> mainly around Naples
  - Campi Flegrei DOC (min 50% of blend, usually 100%)
  - Vesuvio DOC (min 50% of blend, usually 100%)



- pale ruby colour
- red plum, red cherry
- fresh, M+ acidity
- M tannins
- M alcohol
- uses:
  - early-drinking varietal wines
  - to soften Aglianico-based wines
    - add perfume & freshness
- mid-priced to premium

- old Campanian red variety, probably Vesuvius area
- many still on original rootstocks (sandy soils => phylloxera doesn't spread)
- harvested late but still only 12-13% alcohol
- mainly for local market; some international interest (volcanic wines)

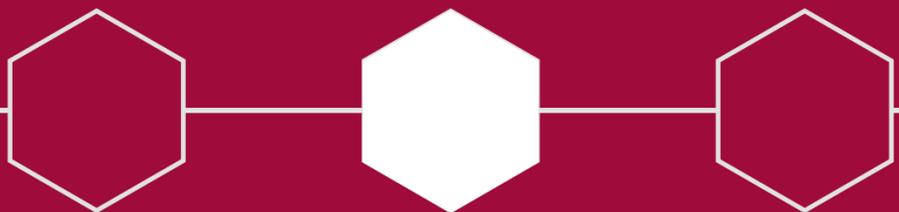




MID BUDDING

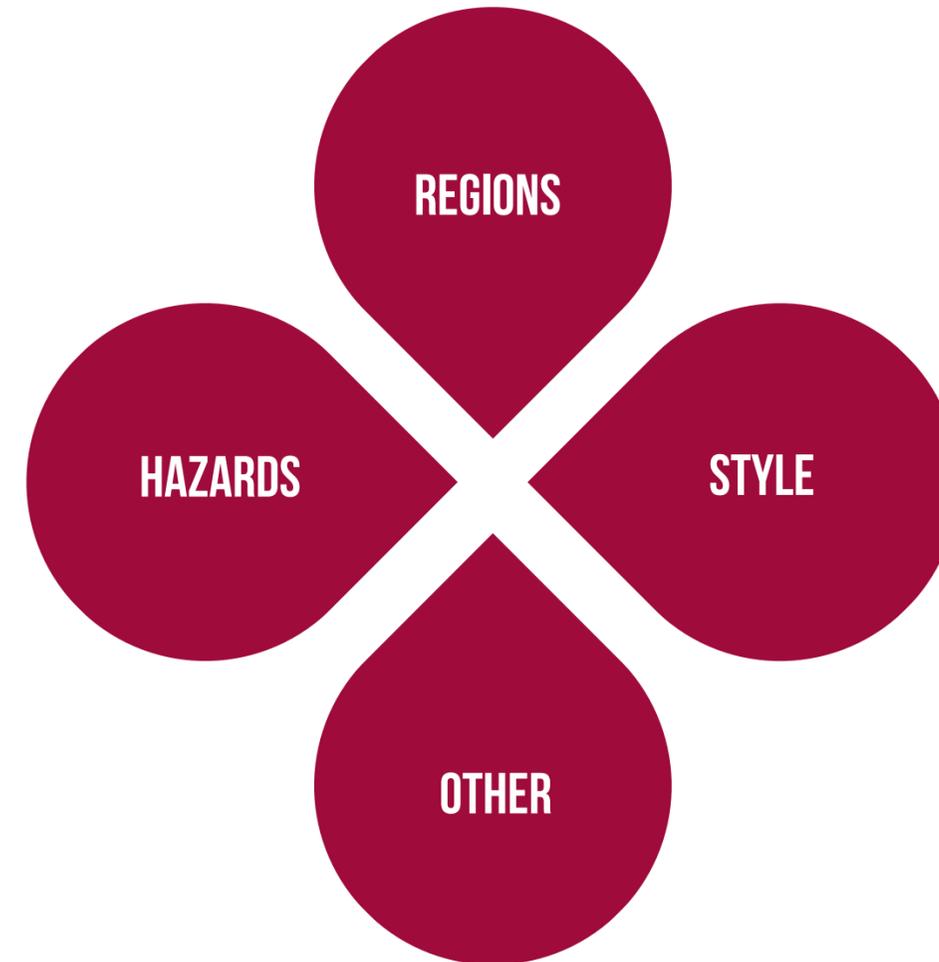
# TANNAT

MID RIPENING



- FR: South West (Madiran AOC)
- Argentina
- (Also: Uruguay - not in course book)

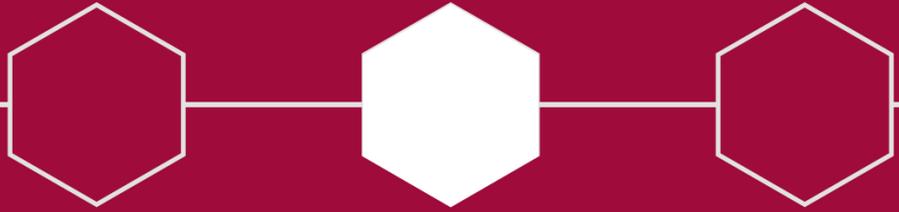
- botrytis bunch rot



- highly tannic variety

- ageworthy styles:
  - deep ruby colour
  - pronounced intensity
  - blackberry, blackcurrant
  - oak flavours
  - high tannins
  - high acidity
  - full body, M to high alcohol
  - good to outstanding
  - mid to premium priced
- earlier-drinking styles: lower levels of tannin and concentration

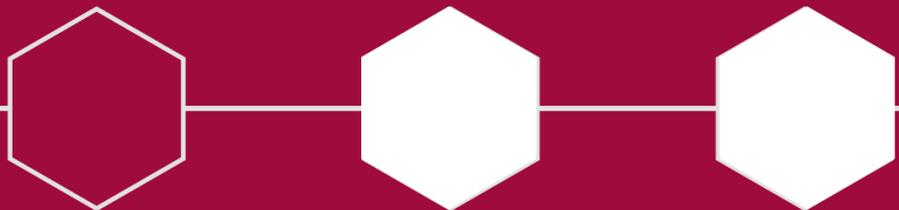




MID BUDDING

# RONDINELLA

MID TO LATE RIPENING



- good disease resistance
- prone to esca

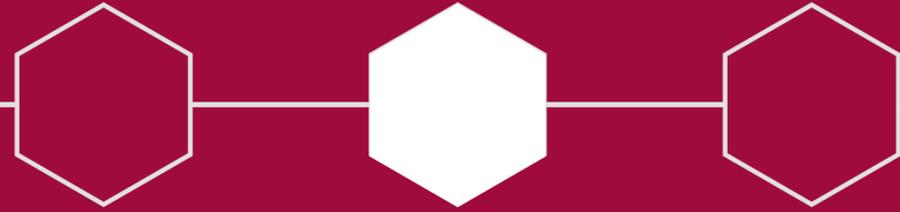


- Veneto, IT

- rather neutral wines with light, simple cherry fruit
- accumulates sugar very fast => useful for Recioto

- very reliable and productive variety

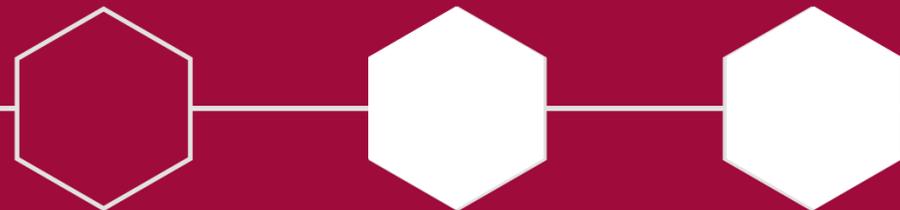




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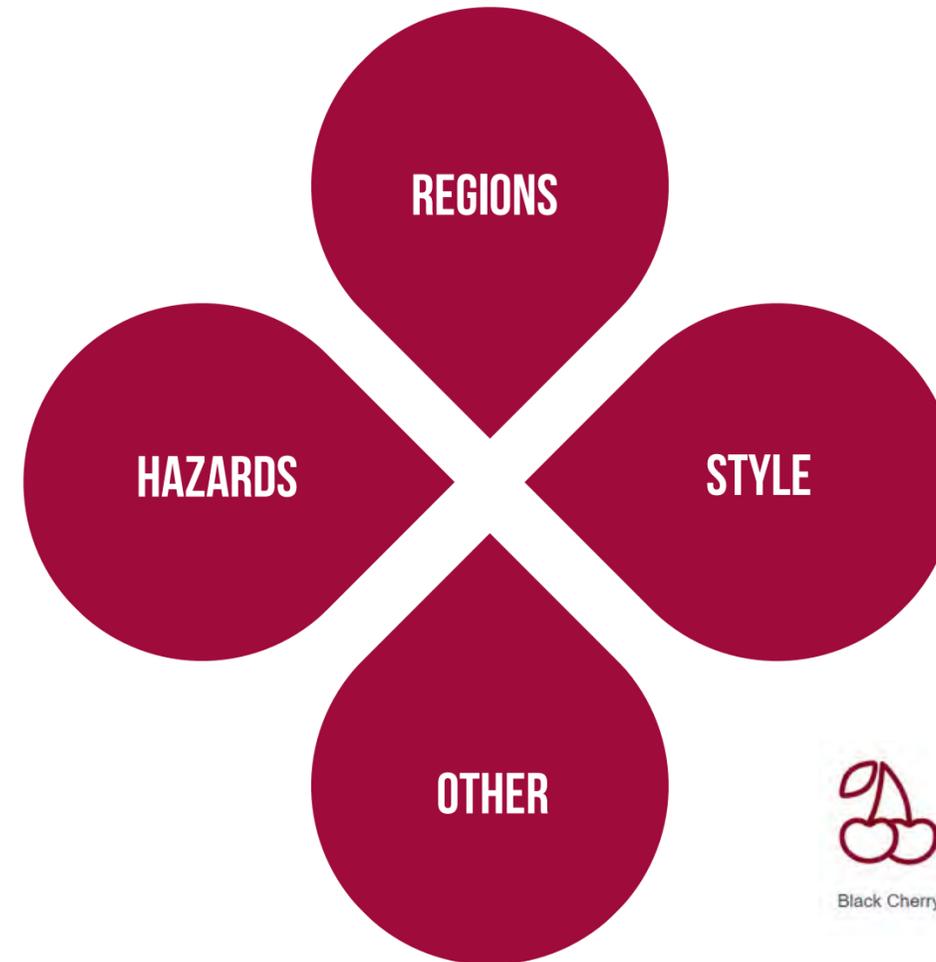
# NEGROAMARO

MID TO LATE RIPENING



- Puglia, IT
  - Salice Salentino Rosso DOC: min. 75% Negroamaro (90% if mentioned on label)

- good disease resistance
- good drought resistance



- black plum, black cherry
- M acidity
- M to high alcohol
- M+ tannins
- inexpensive wines:
  - +- 6m aged in stainless steel
- mid-priced to premium:
  - 1 year oak ageing
- good to very good quality
- inexpensive to mid-priced
- also: rosé / rosato: deep pink orange



Black Cherry



Black Plum



Blackberry

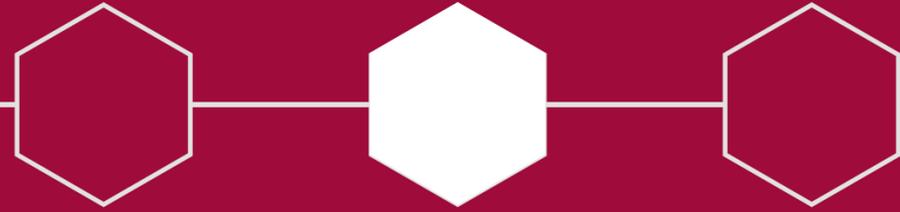


Prune



Dried Thyme

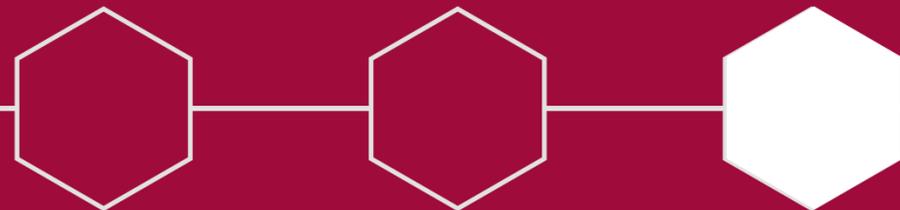
- high-yielding variety
- retains acidity well -> highly suitable for hot climates
- past: used to add alcohol & body to wines from cooler regions



MID BUDDING

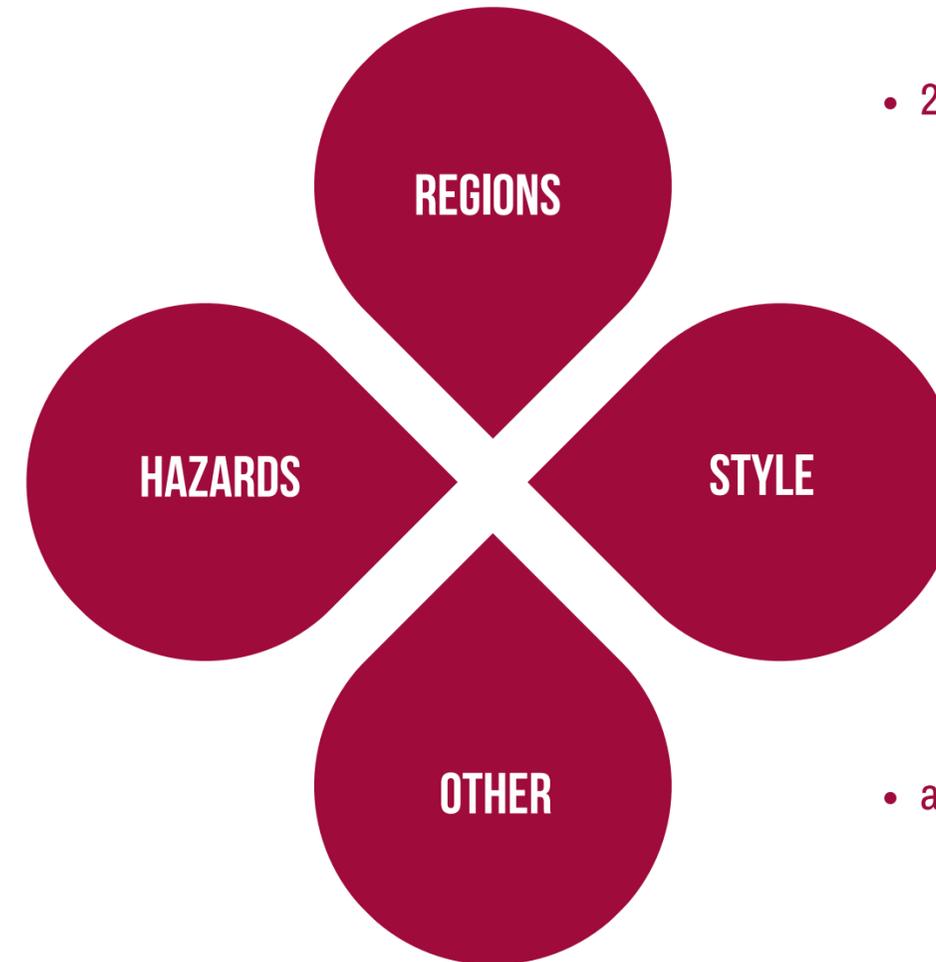
# MONTEPULCIANO

LATE RIPENING



- IT:
  - Marche: often blended with Sangiovese
  - Abruzzo: 55% of plantings
    - 5 official sub-zones of DOC: restricted Y: 66 hL/ha + 18m ageing (9m in oak)
      - former sub-zone, now DOCG: Colline Teramane Montepulciano d'Abruzzo DOCG
        - 2 years of ageing, of which 1 in oak

- powdery mildew



- 2 contrasting styles:
  - short maceration:
    - ripe, M intensity red cherry fruited
    - no oak
  - long maceration, top Q fruit, oak aged
    - M+ to pronounced
    - red cherry & black plum
    - oak aromas (typically large vessels)
    - M+ tannins
- also: Cerasuolo d'Abruzzo rosé

- needs long season to ripen fully and avoid bitterness
- tends to ripen unevenly within bunches => careful selection or lower quality



Cherry



Plum



Boysenberry



Oregano



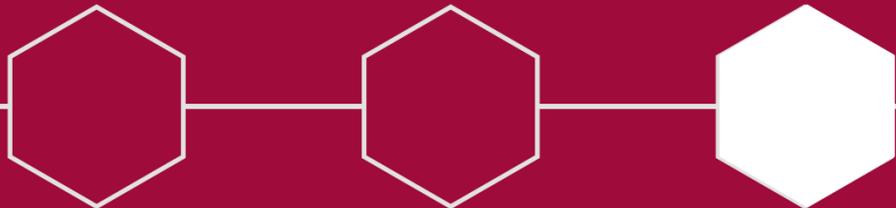
Tobacco



MID BUDDING

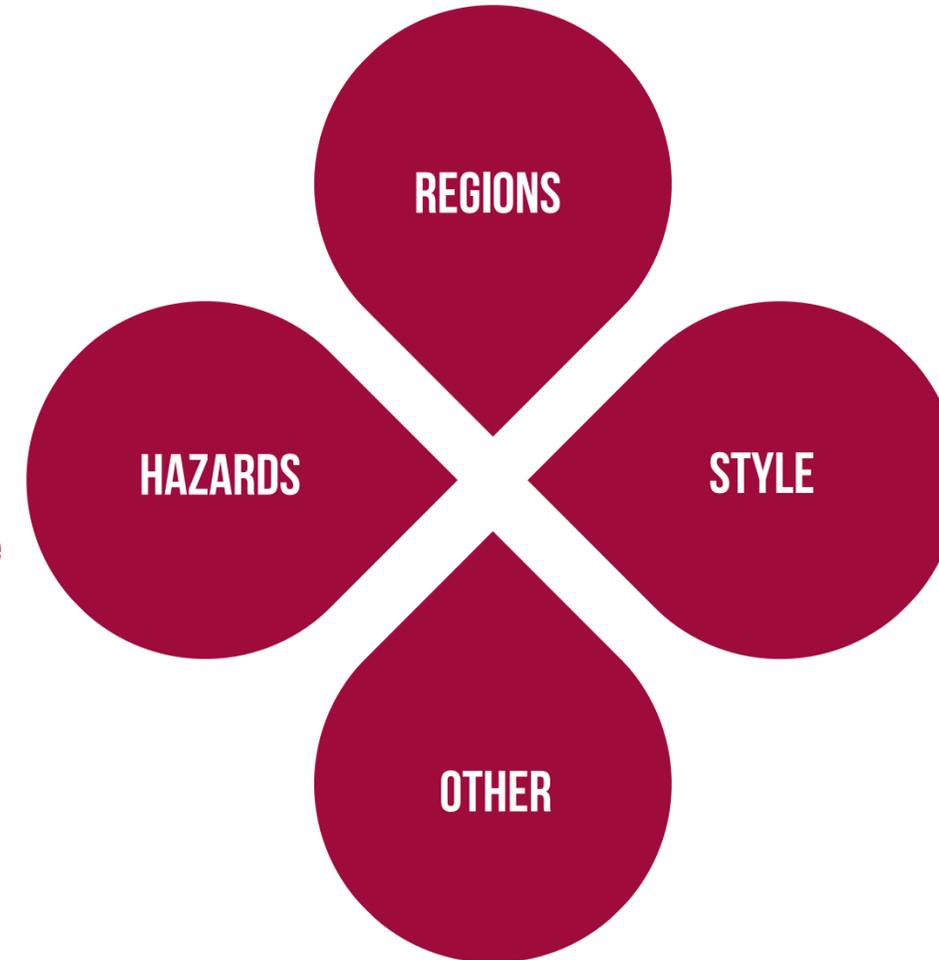
# SAGRANTINO

LATE RIPENING



- powdery mildew
- downy mildew
- tiny spiders on leaves' underside
- vine moths

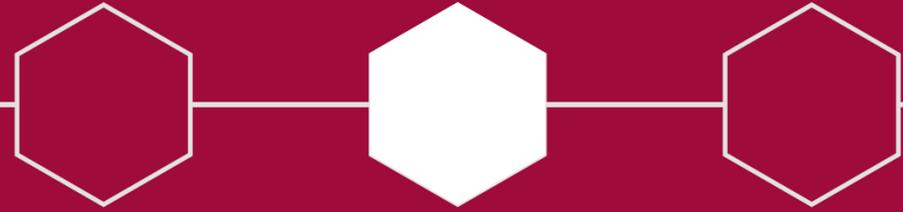
- IT: Umbria
  - Rosso di Montefalco DOC:
    - 60-70% Sangiovese
    - 10-15% Sagrantino
  - Montefalco Sagrantino DOCG: 100% Sagrantino



- very tannic variety
- deep ruby colour
- M+ to pronounced intensity
- blackberry & red plum fruit
- high acidity
- high tannins

- moderately productive
- needs full sunshine and heat to ripen
- vineyards mainly on hillside sites:
  - best sunlight interception
  - good drainage
  - Guyot or spurred cordon, VSP trellised

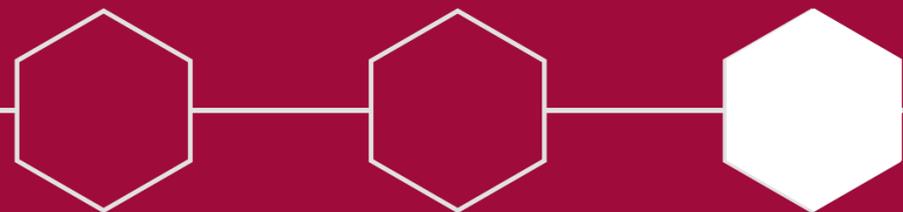




MID BUDDING

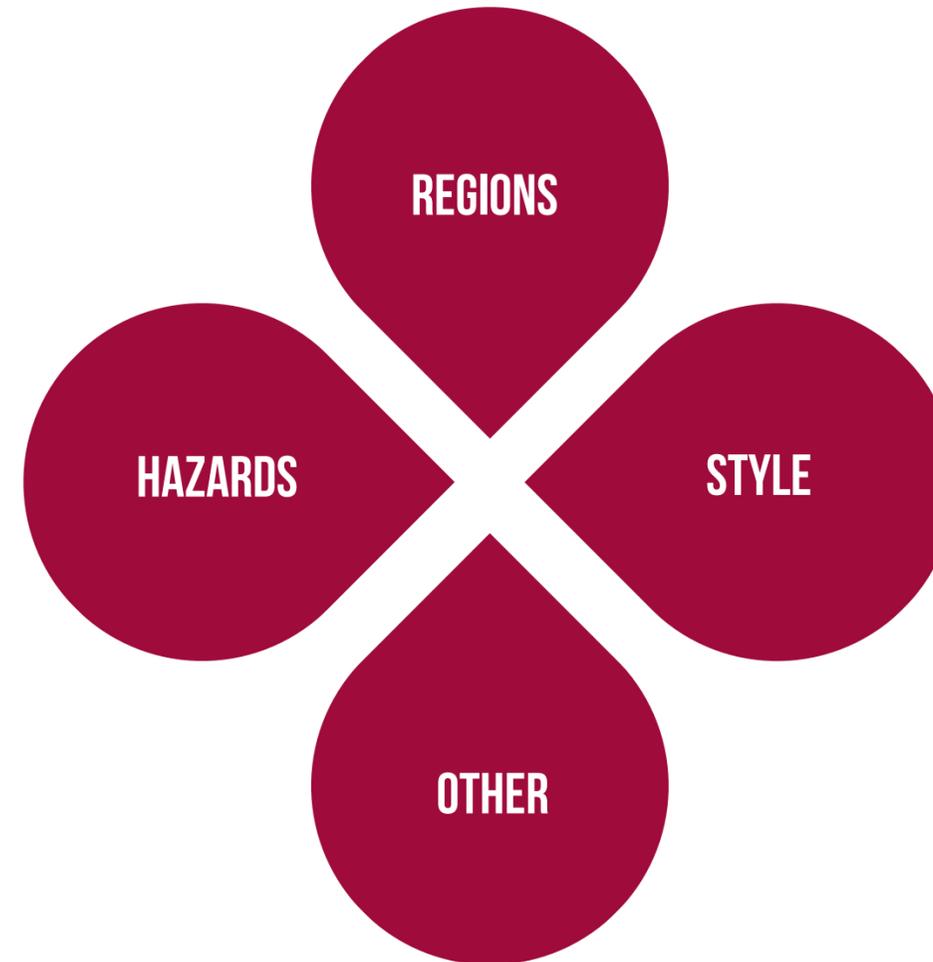
# NERO DI TROIA / UVA DI TROIA

LATE RIPENING



- central/middle parts of Puglia, IT
  - Castel del Monte DOC: min 90% Nero di Troia if variety is on label
  - Castel del Monte Riserva DOCG (2y ageing, of which 1 in wood)

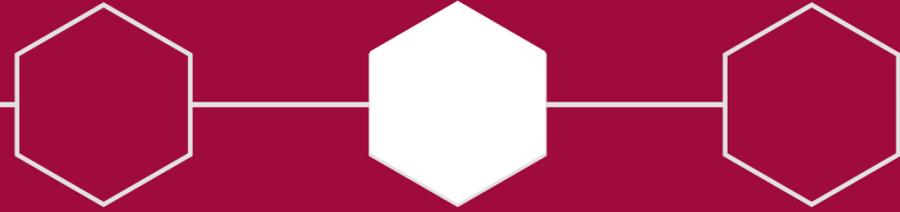
- downy mildew
- autumn rain
- uneven ripening between bunches



- M intensity
- red cherry, redcurrant, black pepper
- M+ acidity
- high but fine-grained tannins
- DOC: usually unoaked
- Riserva DOCG: characteristics from French barriques or large casks

- needs long season to develop full colour
- bunches ripen at different times => several passes through the vineyard => adds to cost

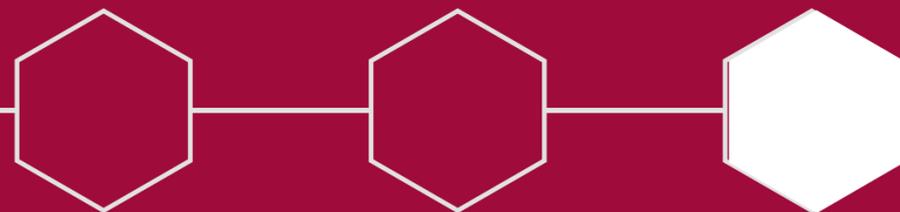




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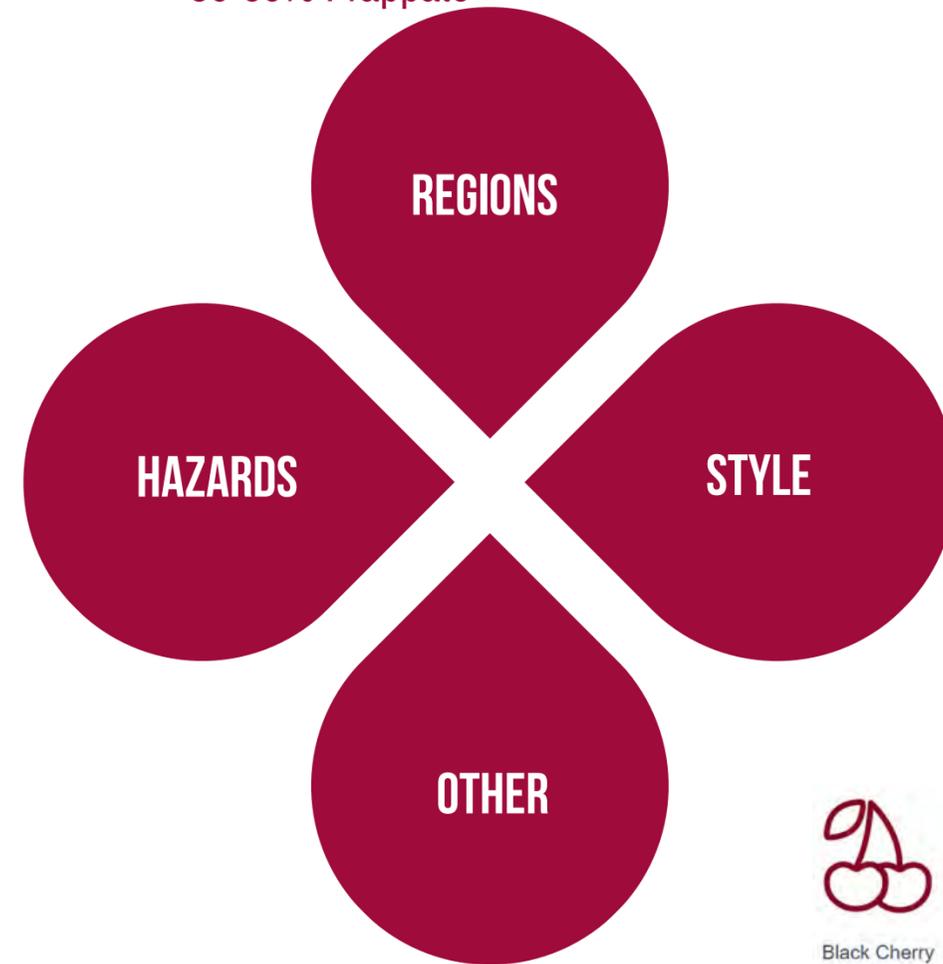
# NERO D'AVOLA / CALABRESE

LATE RIPENING



- powdery mildew
- uneven flowering: affects yields

- Sicily, IT: most planted black variety (16% of total plantings)
  - often monovarietal in DOCs, IGT or 'Wine'
  - blended with black Frappato in Sicily's only DOCG wine: Cerasuolo di Vittoria DOCG:
    - 50-70% Nero d'Avola
    - 30-50% Frappato



- M to deep ruby colour
- red cherry to black plum fruit
- M to M+ acidity
- M+ to high tannins
- moderate yields:
  - very good to outstanding
  - aged in small oak barrels
  - mid-priced to premium
- high yields:
  - acceptable to good
  - short ageing: stainless steel (6m)
  - inexpensive to mid-priced



Black Cherry



Black Plum



Licorice

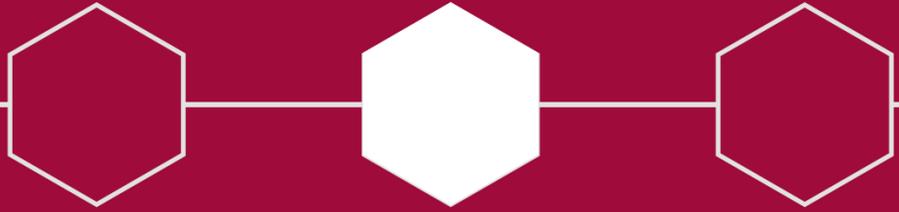


Tobacco



Chili Pepper

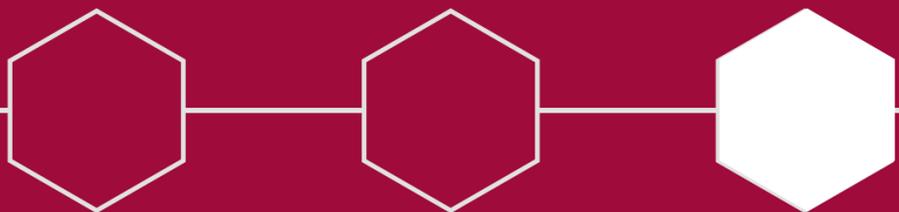
- grows well in a hot climate, but adaptable: also in damper, cooler sites
- WSET: late-ripening; Wine Grapes book: mid ripening
- often grown close to the ground (to maximise heat)
- very vigorous => lots of canopy management required -> adds to cost
- can suffer from uneven flowering: yields differ from year to year



MID BUDDING

# XINOMAVRO

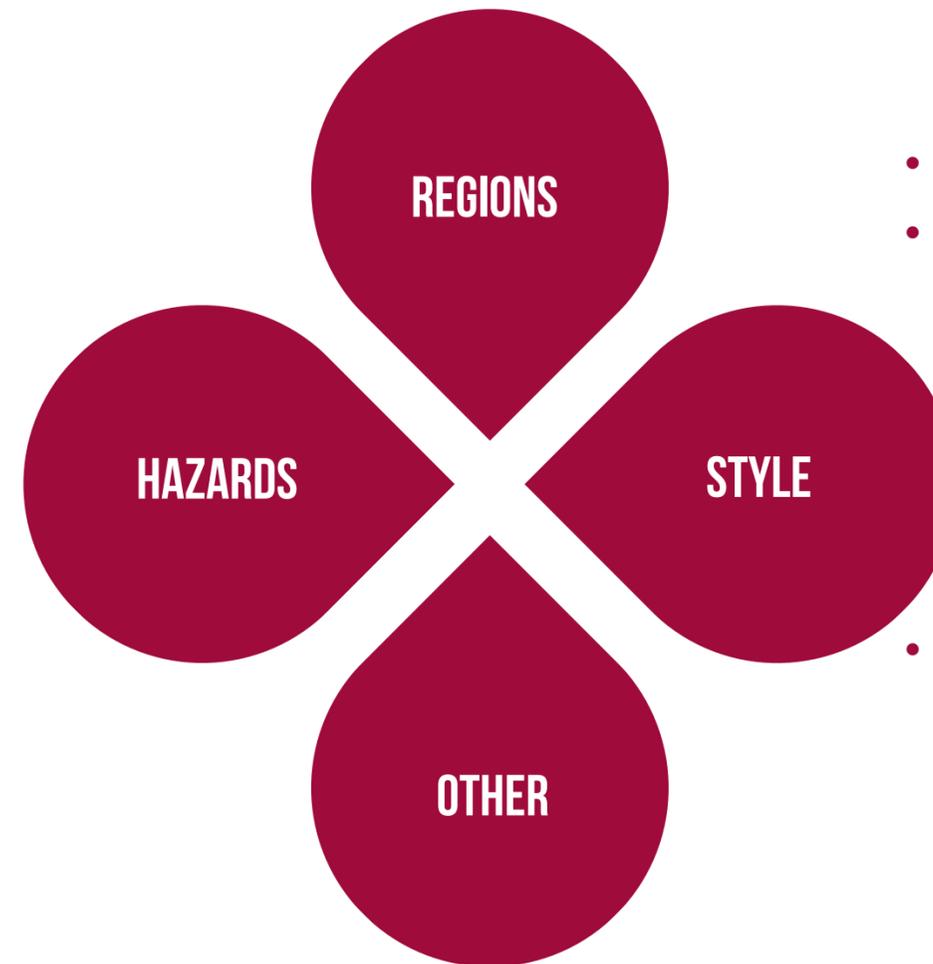
LATE RIPENING



wine & words

- downy mildew
- botrytis bunch rot

- Greece, mainly N. Greece
  - most famous: PDO Naoussa in N. Macedonia



- pale-coloured, turn garnet rapidly
- best wines (low yields, oak aged):
  - very ageworthy
  - high acidity, high tannins
  - highly complex:
    - flowers, herbs, spices, leather, earthiness
- more recently: more fruity, softer wines, more accessible in youth
  - lower lvs of acidity, often new oak
  - some: blend with Merlot to soften

- often likened to Nebbiolo: in youth: can have unpleasantly high acidity and grippy tannins
- often benefits from long bottle ageing

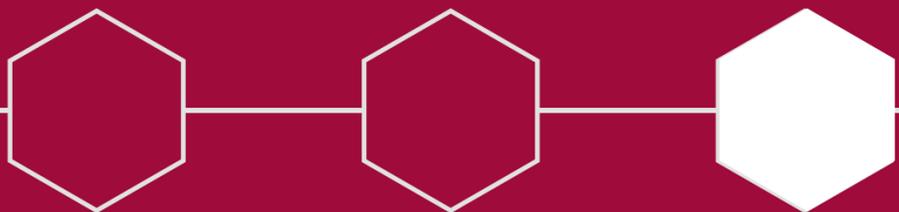




MID BUDDING

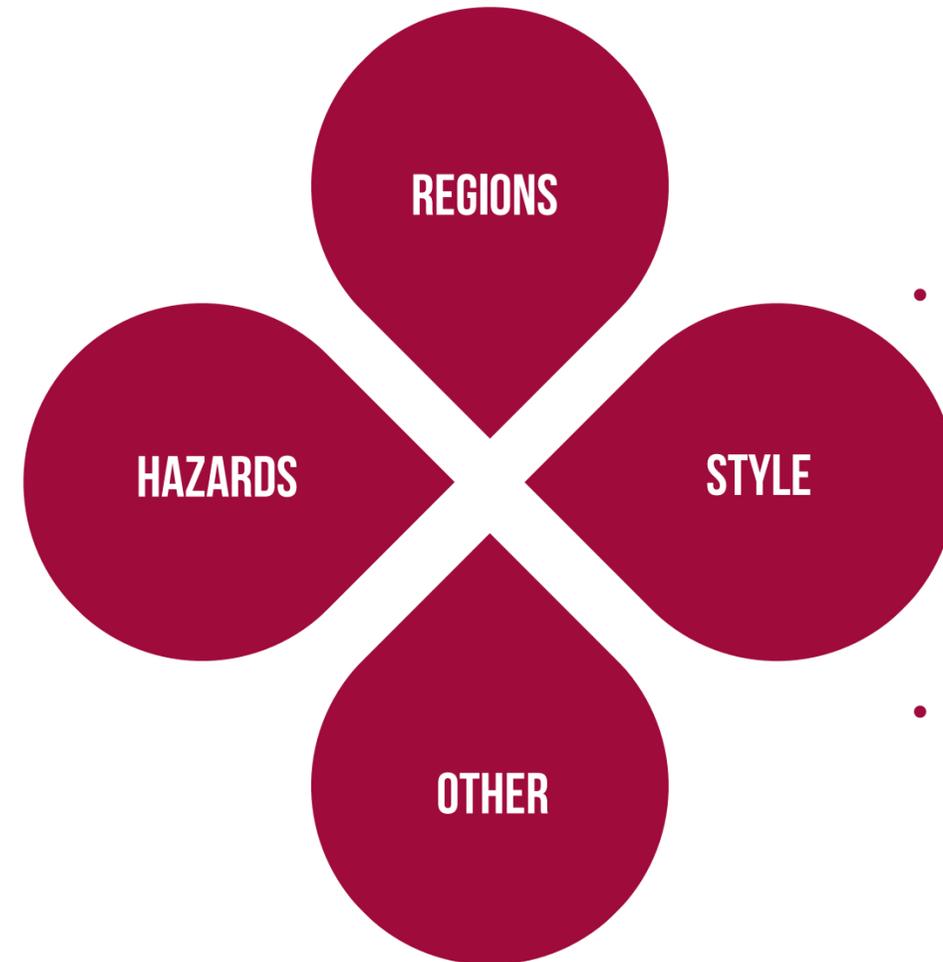
# CARMENÈRE

LATE RIPENING



- coulure

- Fr: Bordeaux
- IT: Trentino
- Chile
- China ('Cabernet Gernischt')



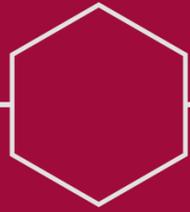
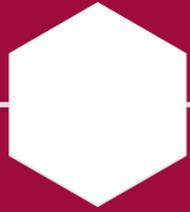
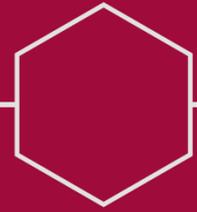
- good & very good examples:
  - M acidity
  - ripe black fruits (blackberry)
  - herbaceous: bell pepper, eucalyptus
  - full-bodied
  - high tannins
- when oaked: spice, roasted coffee, dark chocolate

- officially identified in Chile in 1994 (before: thought to be Merlot)
- often in blends, increasingly as single varietal
- site selection: important: ripens 2 to 3 weeks after Merlot
- needs warm (not too hot) sites (otherwise: overly herbaceous & harsh tannins)
  - if too ripe: overly alcoholic



## CARMÉNÈRE

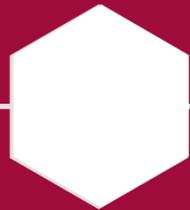
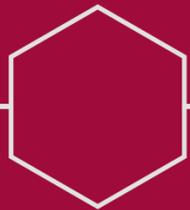
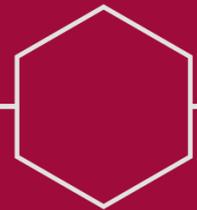
THE GRAPE GRIND



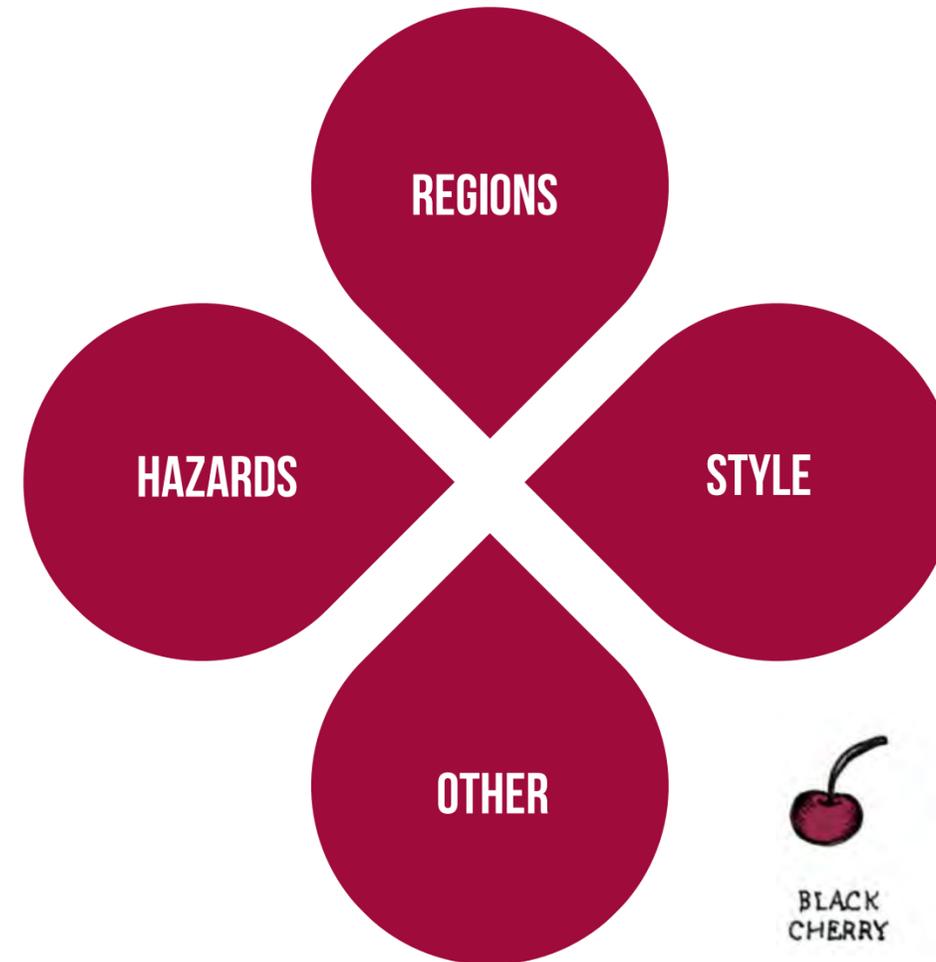
MID BUDDING

# BONARDA ARGENTINA

LATE RIPENING



- 2nd most planted black variety in Argentina
  - mainly in San Juan and warmer areas of Mendoza



- deep colour
- red & black fruit flavours
- M+ acidity
- M tannins, M alcohol
- if oak used: large and/or old vessels  
-> not to overwhelm Bonarda
- popular blending partner with Malbec or Cab Sauv.
- old vines/lower yields: more complex: riper black fruit & spice



BLACK CHERRY



PLUM SAUCE



ALLSPICE

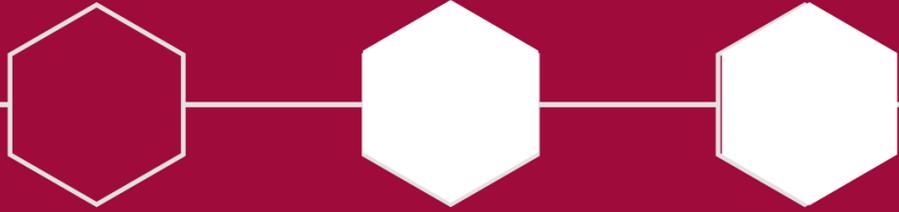


VIOLET



TOBACCO LEAF

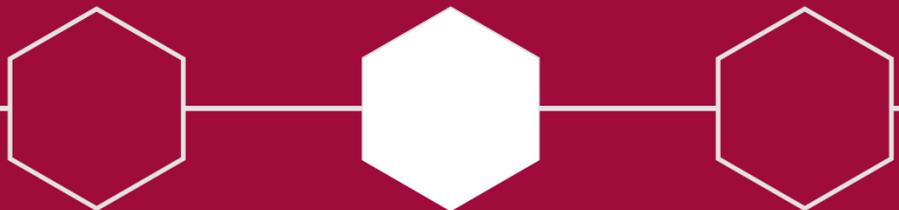
- = Douce Noire (Savoie, FR)
- not related to the Bonardas of Italy
- high yielding -> for large volumes of inexpensive wines, mainly domestic consumption (> 85% consumed domestically)
- when yields are limited: more intensity and structure



MID TO LATE BUDDING

# SYRAH/SHIRAZ

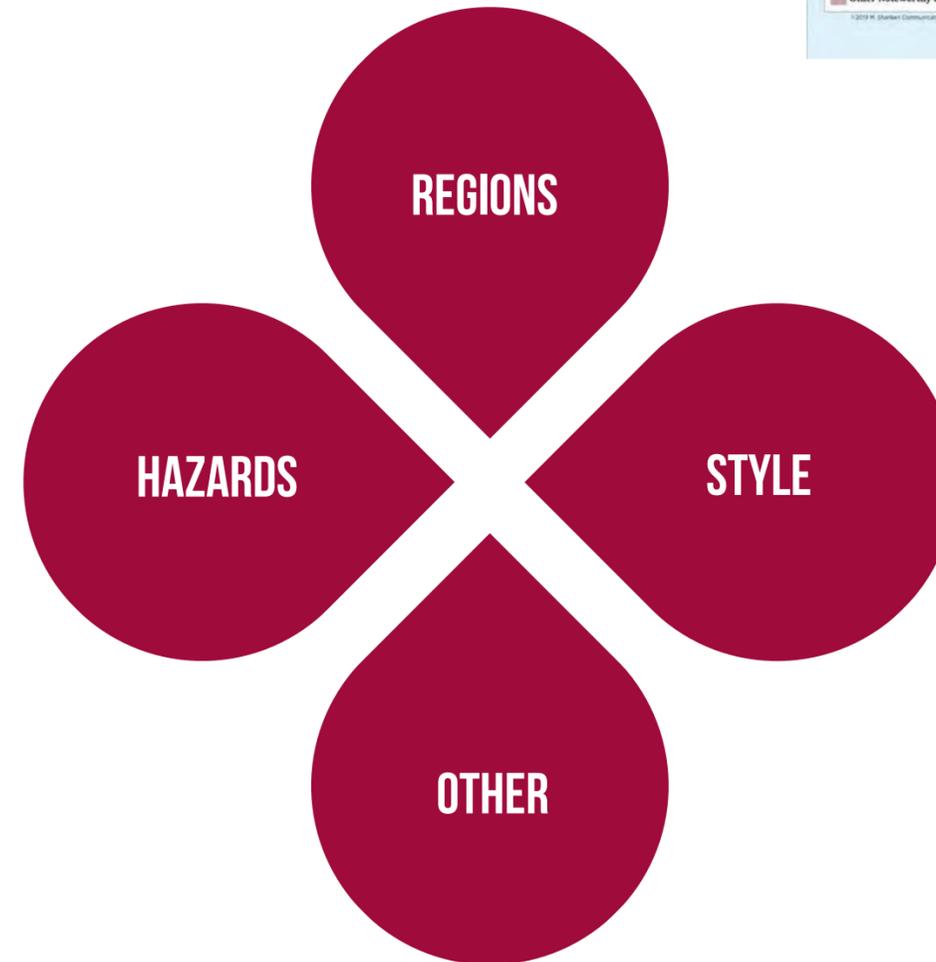
MID RIPENING



- FR: Rhône, Languedoc, Roussillon, Provence
- Greece, Central Italy, Southern Italy, Spain, Portugal
- USA: California, Oregon, Wash. State. Canada
- Chile, Argentina, South Africa, Australia, New Zealand



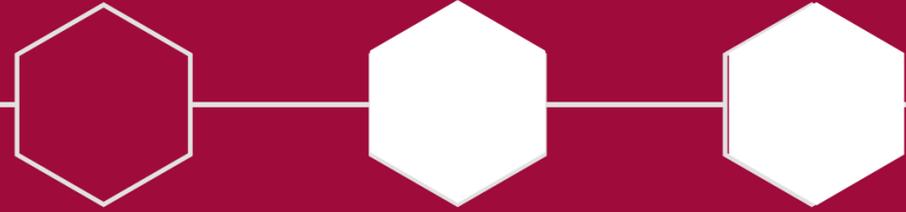
- mites
- botrytis bunch rot
- chlorosis (soils with high active lime content)
- 'Syrah's decline/disorder'



- vigorous variety
- in N. Rhône: careful training and tying in to protect from Mistral wind

- N. Rhône crus:
  - deep ruby colour
  - M to pronounced intensity
  - violet, plum (red: cooler; black: warmer), blackberry, herbal
  - leather, liquorice and tar
  - pepper aroma (rotundone)
  - M to high acidity
  - M to high tannins
- S. Rhône blends: adds structure, fruit and colour
- other regions/countries: wide range of warmer & cooler styles

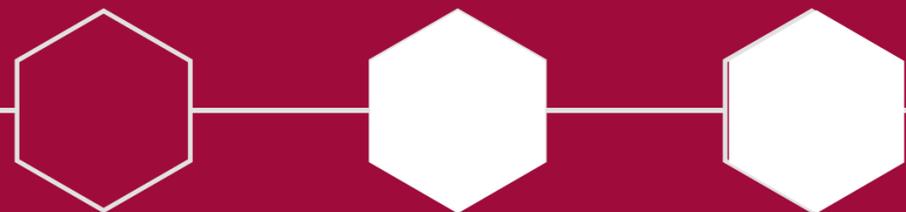




MID TO LATE BUDDING

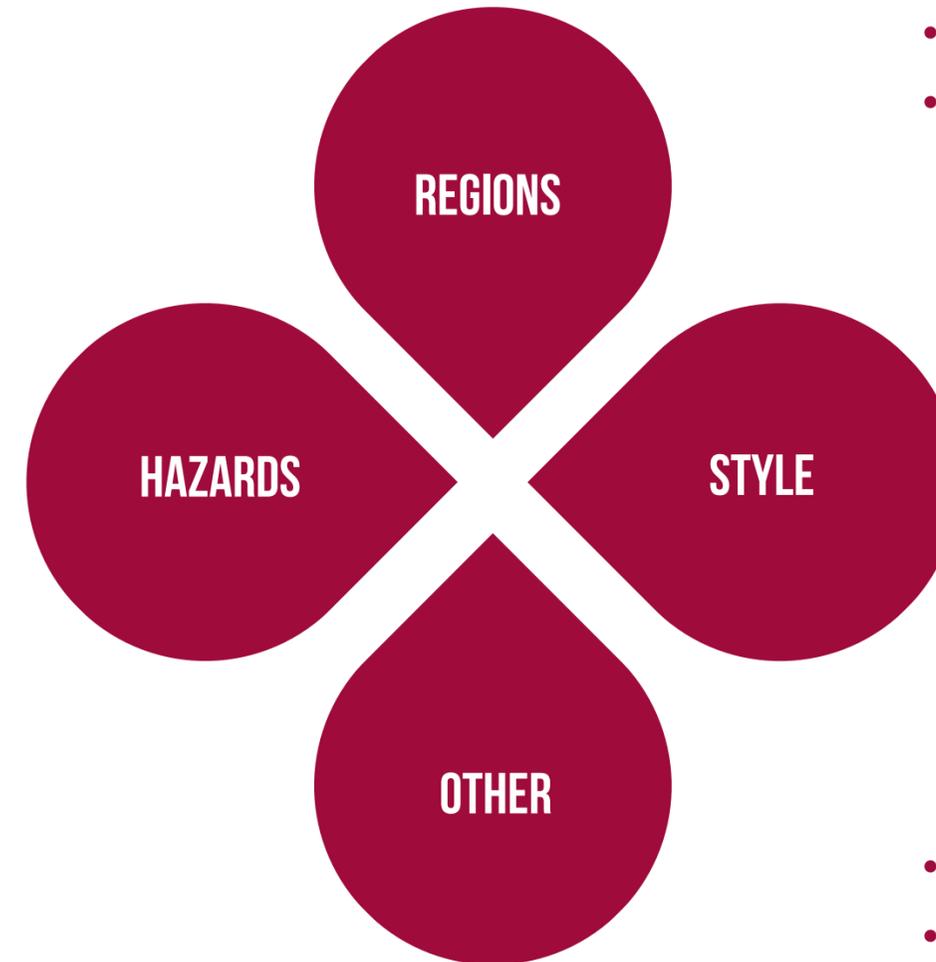
# BOBAL

MID TO LATE RIPENING



- ES, Utiel-Requena DO
  - > 70% of plantings
  - many vines > 40 years old

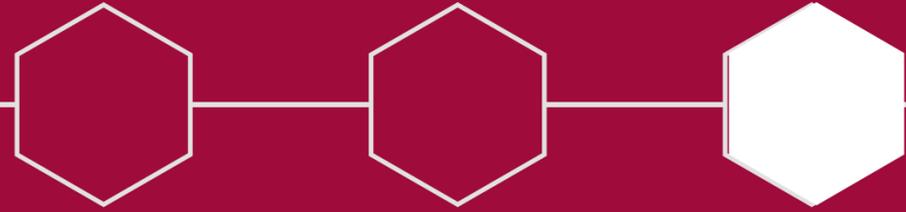
- drought tolerant



- high acidity & fruity => traditionally best known for rosé wines
- now: most for red wines
- different styles:
  - light-bodied, M tannin, often semi-carbonic maceration
  - concentrated wines:
    - high acidity
    - M+ tannins
    - M+ to full body
    - flavours of blackberry, black cherry, chocolate
    - often from old vines
    - matured in oak for complexity
- acceptable to very good
- inexpensive to mid-priced

- very drought tolerant
- able to retain acidity even in hot climates
- can ripen unevenly -> tannins can be a little grippy if some bunches are unripe
- can be vigorous & high-yielding
- gives high lvls of colour => used as blending component, esp. in inexpensive wines

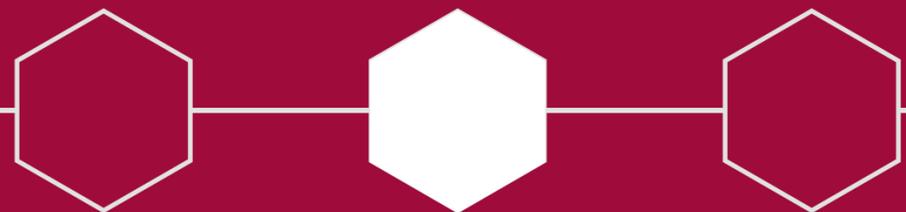




LATE BUDDING

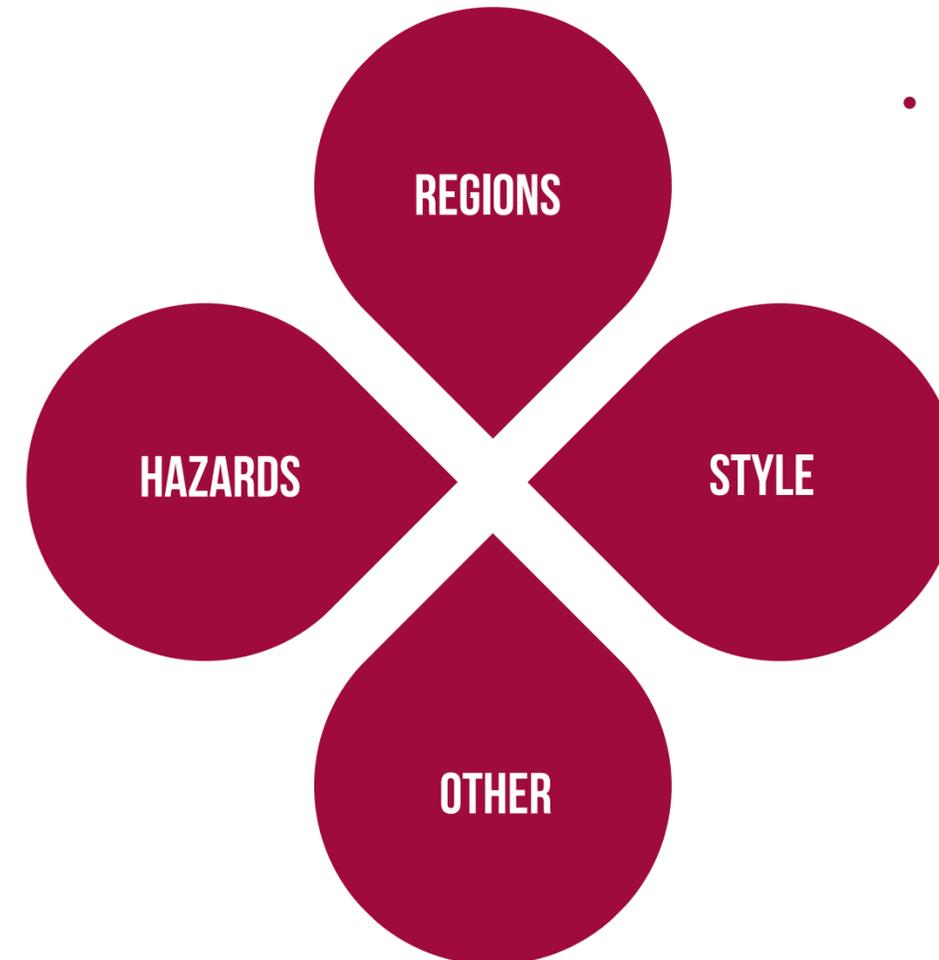
# CINSAUT / CINSAULT

MID RIPENING



- chlorosis on lime soils
- mites
- grape moths
- trunk diseases (Esca, Eutypa)

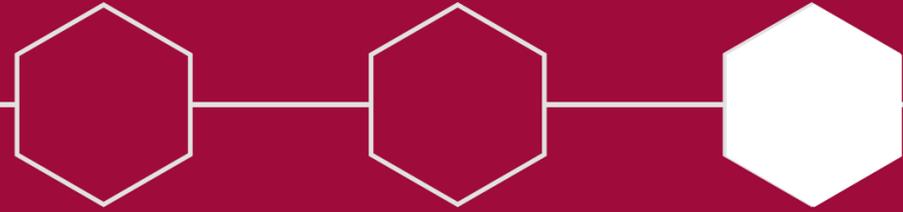
- FR: S. Rhône, Languedoc, Provence
- California, USA
- Chile: Itata, Maule (old bush vines)
- South Africa (known as Hermitage)



- S. Rhône: typically small % of red blends
  - made in fruity style:
    - stainless steel
    - mid-range F t°
    - for early drinking reds & rosés)
  - contributes:
    - light ruby colour
    - M to M+ intensity
    - fresh red fruit: raspberry, cherry
    - high alcohol
    - low to M tannins

- high-yielding => restrict for highest quality
- good drought and heat resistance
- parent of Pinotage (Cinsaut: known as 'Hermitage')

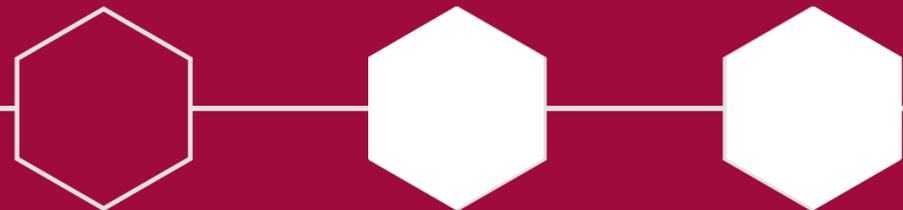




LATE BUDDING

# CABERNET SAUVIGNON

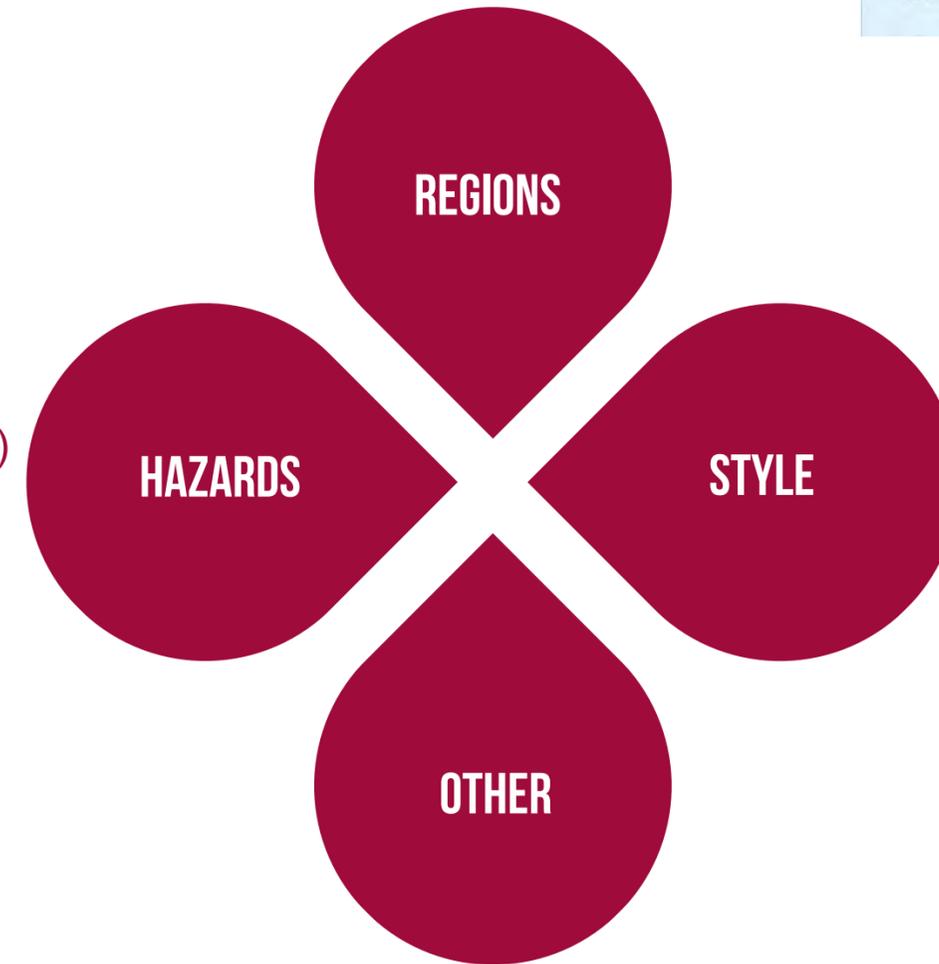
MID TO LATE RIPENING



- FR: Bordeaux (Left Bank, Médoc gravel beds); Loire (Anjou); Languedoc, Provence
- California, USA
- Coonawarra, AUS
- Chile, Argentina, South Africa, ...



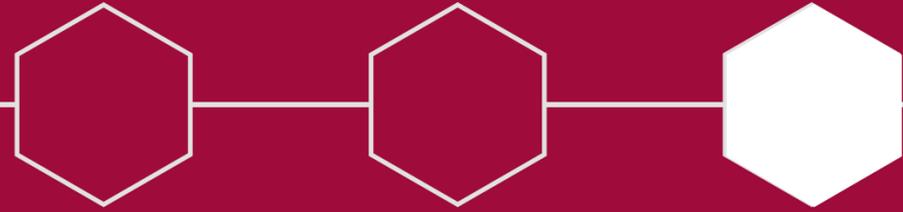
- fungal diseases, esp. powdery mildew
- trunk diseases (ESCA, Eutypa)
- fanleaf virus
- coulure
- early autumn rains



- pronounced intensity
- violet, blackcurrant, black cherry
- menthol or herbaceous
- high acidity
- high tannins
- M alcohol

- small-berried, thick-skinned
- highest Q fruit on warm, well-drained soils
- in cooler years: could struggle to ripen in Bdx => often blended with Merlot & Cab Franc
- vigorous variety

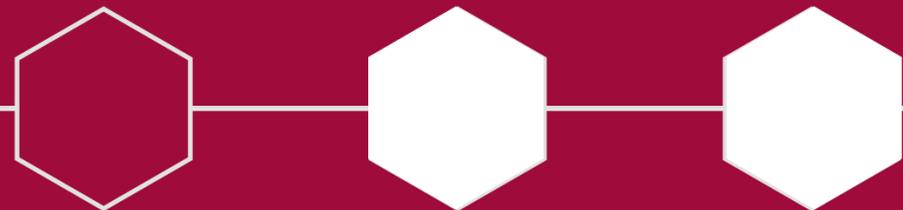




LATE BUDDING

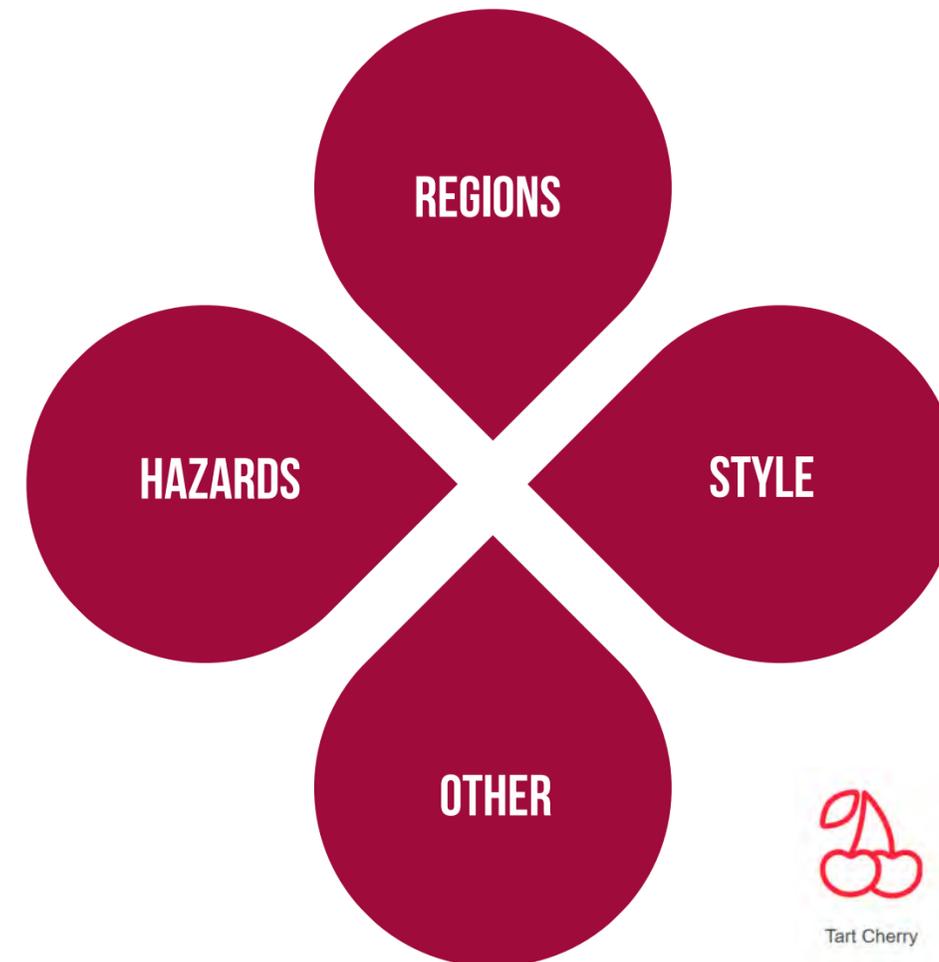
# CORVINA VERONESE

MID TO LATE RIPENING



- downy mildew, botrytis, esca
- drought
- sunburn

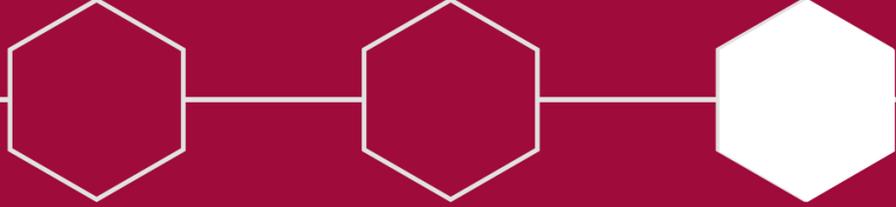
- Veneto, IT
  - Valpolicella DOC / Recioto della Valpolicella DOCG / Amarone della Valpolicella DOCG / Valpolicella Ripasso DOC
  - Bardolino DOC / Bardolino Superiore DOCG



- mostly blended in Valpolicella & related wines. Contributes:
  - violet
  - red cherry, red plum
  - herbal note
  - low to M tannins
  - high acidity

- vigorous and dependable -> high yields
- thick skins => suitable for drying
- well suited to pergola training:
  - does not fruit on first few buds
  - shade prevents sunburn
  - air circulation => reduces disease

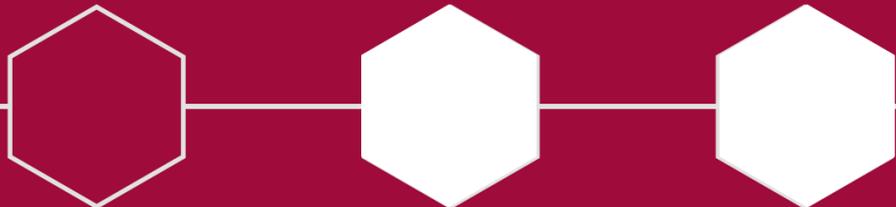




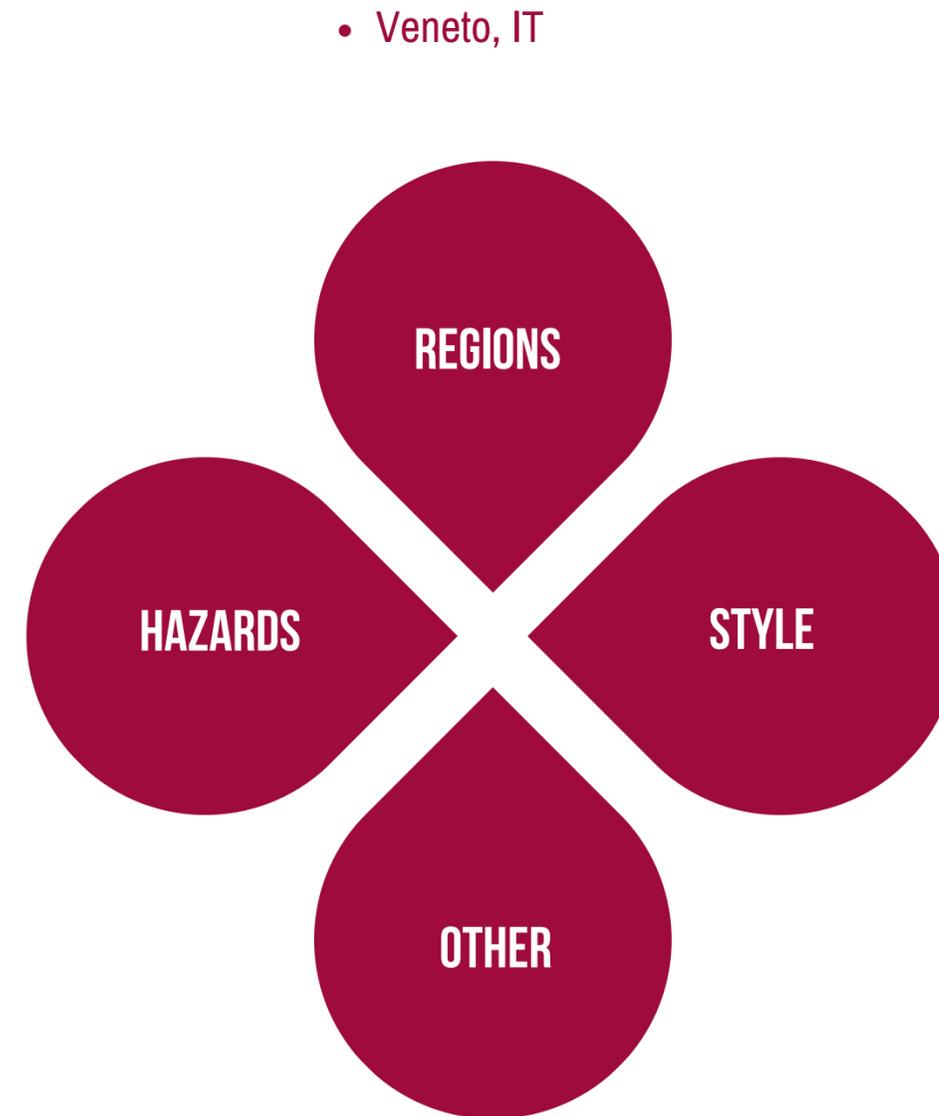
LATE BUDDING

# CORVINONE

MID TO LATE RIPENING



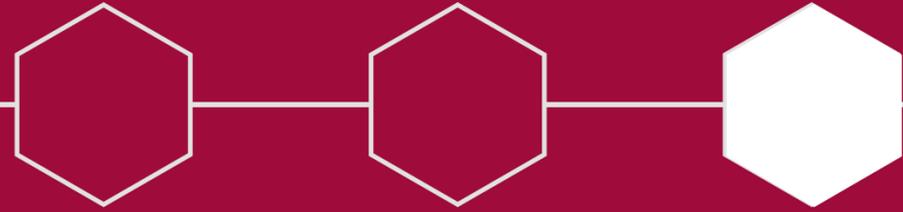
- downy mildew



- = 'big Corvina'
  - big clusters, but not related to Corvina
- berries do not ripen uniformly => grape selection at harvest -> adds work and cost

- mostly blended in Valpolicella & related wines. Contributes:
  - red cherry fruit
  - tannins
- dries well (appassimento)

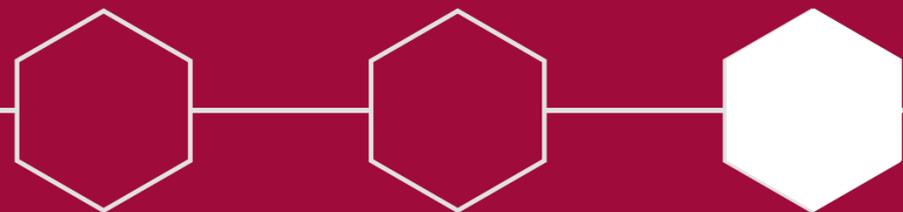




LATE BUDDING

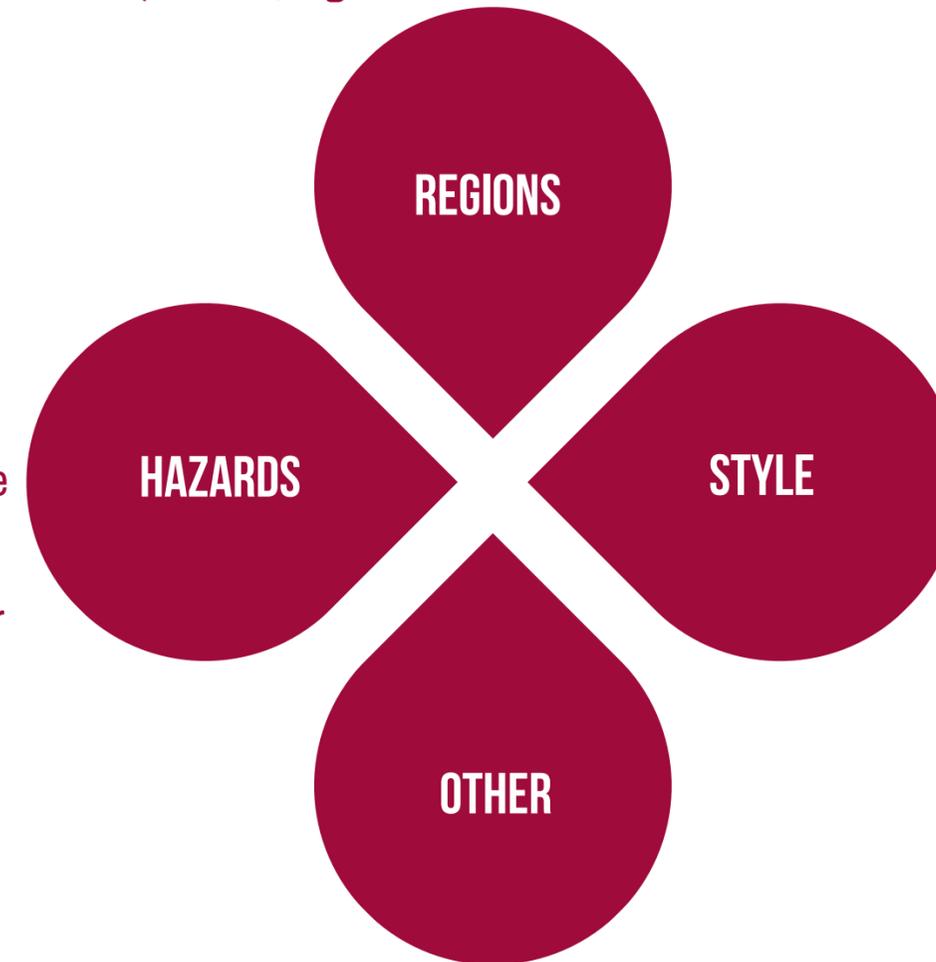
# MOURVÈDRE/ MONASTRELL

LATE RIPENING



- France: Southern Rhône; Bandol AOC, Provence (red & rosé); Languedoc; Roussillon
- SE Spain: Valencia, Murcia: Jumilla DO, Yecla DO
- California (Central Valley, Sierra Foothills)
- Chile, South Africa (Paarl, Swartland)
- Australia ('Mataro', e.g. McLaren Vale)

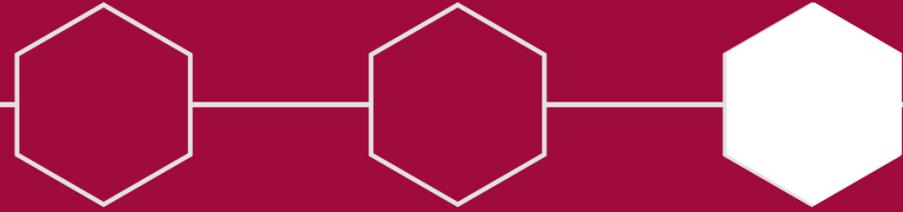
- mites
- leafhoppers (vector for grapevine yellows)
- sour rot (disease due to insect or bird damage to grapes)



- contributes to S. Rhône blends:
  - deep ruby colour
  - intense aromas of violets, blackberries, blueberries
  - high alcohol; high, firm tannins
- Jumilla style:
  - full-bodied, high alcohol
  - ripe blackberry and cherry fruit
  - spice from oak maturation
  - very good examples: M+ acidity

- only thrives in warm and hot climates
- low yielding
- needs high t° at season's end to ripen fully
- requires only small but regular amounts of H<sub>2</sub>O
- best pruned short, on cordon or bush vines
- strongly prone to reduction! -> adequate O<sub>2</sub> to must

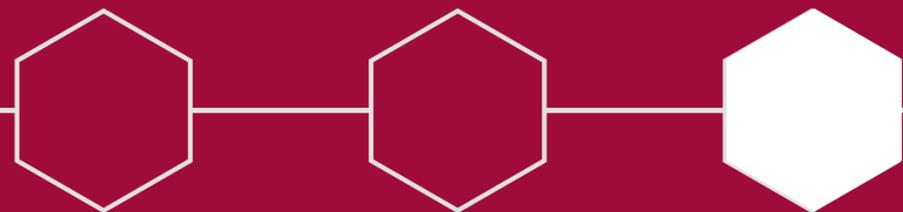




LATE BUDDING

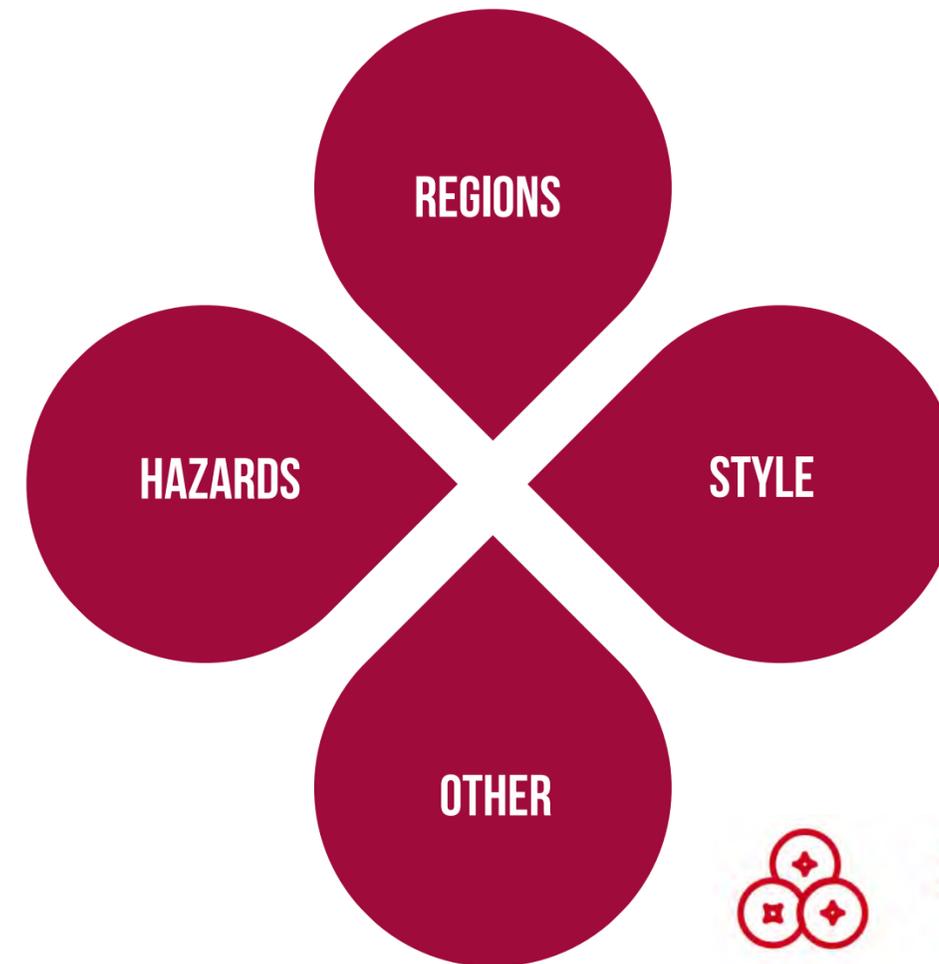
# CARIGNAN / CARIÑENA

LATE RIPENING



- powdery mildew
- grape moths
- heat and drought resistant

- FR: Languedoc, Roussillon, Provence
- IT: Sardinia ('Carignano') -> Carignano del Sulcis DOC
- ES: Catalunya, Rioja ('Mazuelo')



- high acidity and tannins => often softened by carbonic maceration or blending
- unoaked versions:
  - M ruby colour
  - simple blackberry fruit
  - high acidity, high tannins
  - inexpensive (acc. to good Q)
- some: very good to outstanding Q:
  - intense black fruit
  - spice & earthy notes
  - (super) premium



Dried Cranberry



Raspberry



Tobacco Leaf

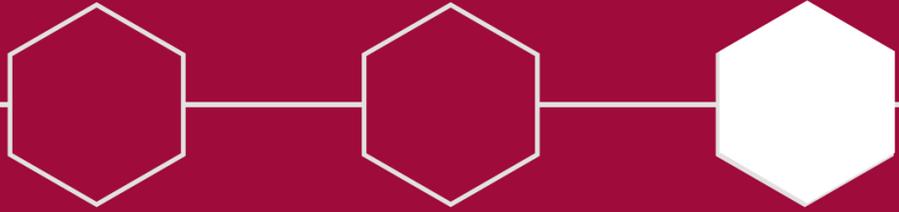


Baking Spices



Cured Meat

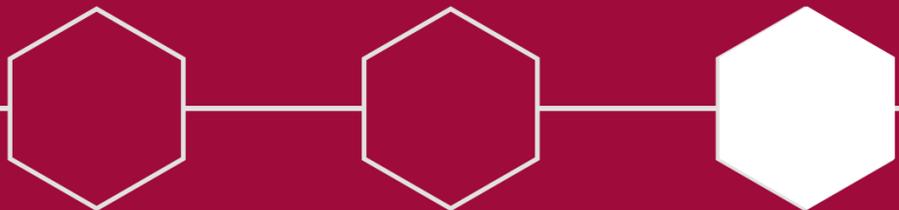
- needs warm climate with long ripening season
- can produce high yields (200 hL/ha and more!)
  - in the past: popular for high volume production
- for high concentration: strictly reduced yields and/or old vines
- bunches: firmly attached to vine -> usually hand harvested



LATE BUDDING

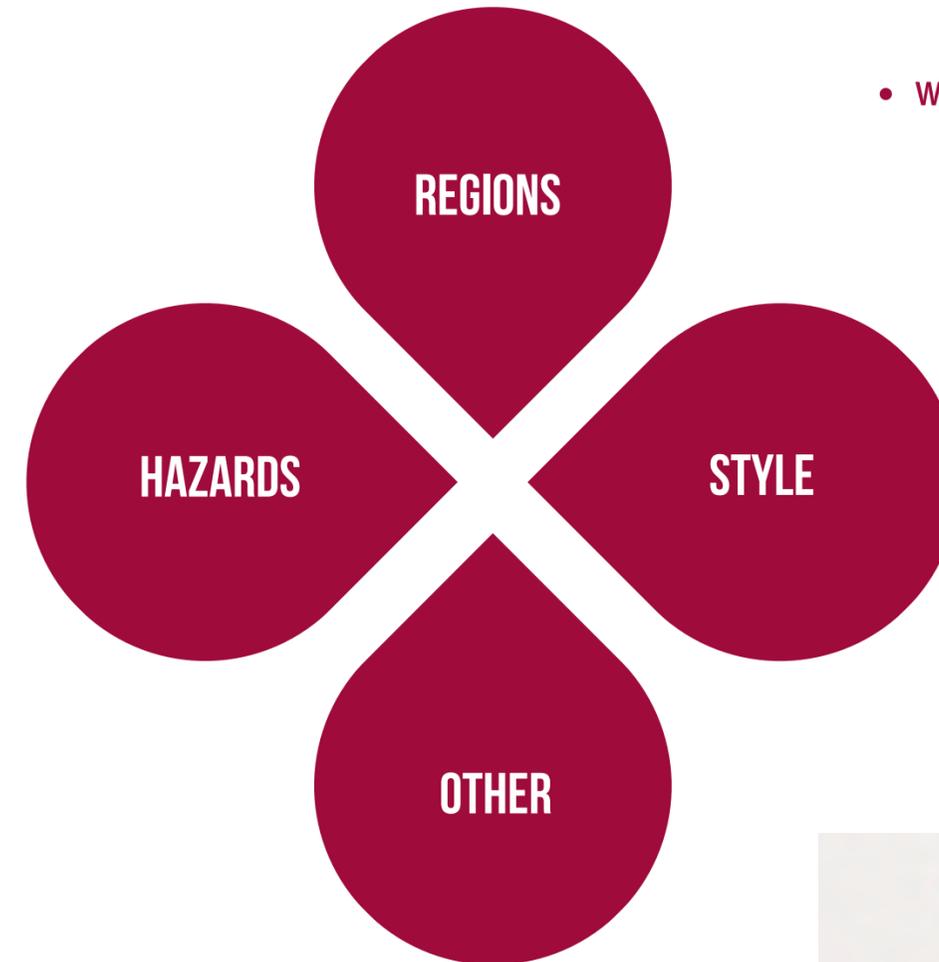
# AGIORGITIKO

LATE RIPENING



- viral diseases
- potassium deficiency
- water stress

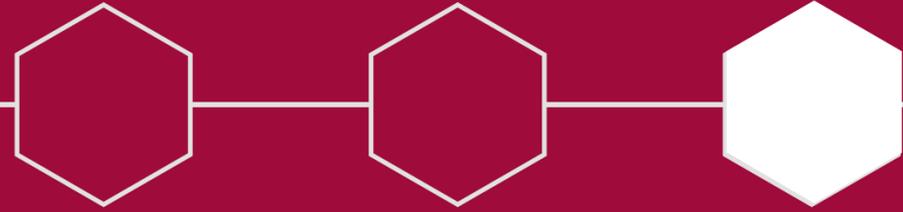
- Greece: most planted black variety (3rd most overall)
  - mainly in Peloponnese, especially PDO Nemea



- wide range of styles:
  - lighter, fruity for early drinking
  - more complex, ageworthy
    - deeply coloured
    - ripe red fruit, sweet spices
    - often oak aged, with % new
    - full-bodied, medium alcohol
    - M acidity
    - M to high levels of soft tannins
  - high quality rosés
  - even sweet wines

- potentially high yielding

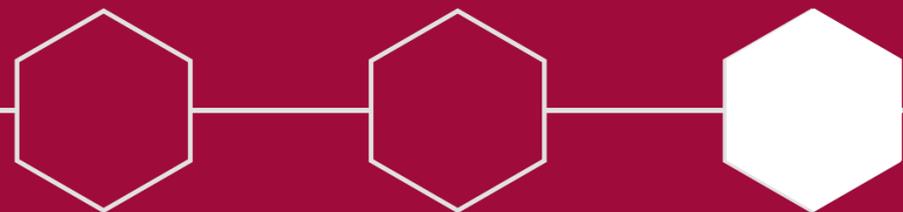




LATE BUDDING

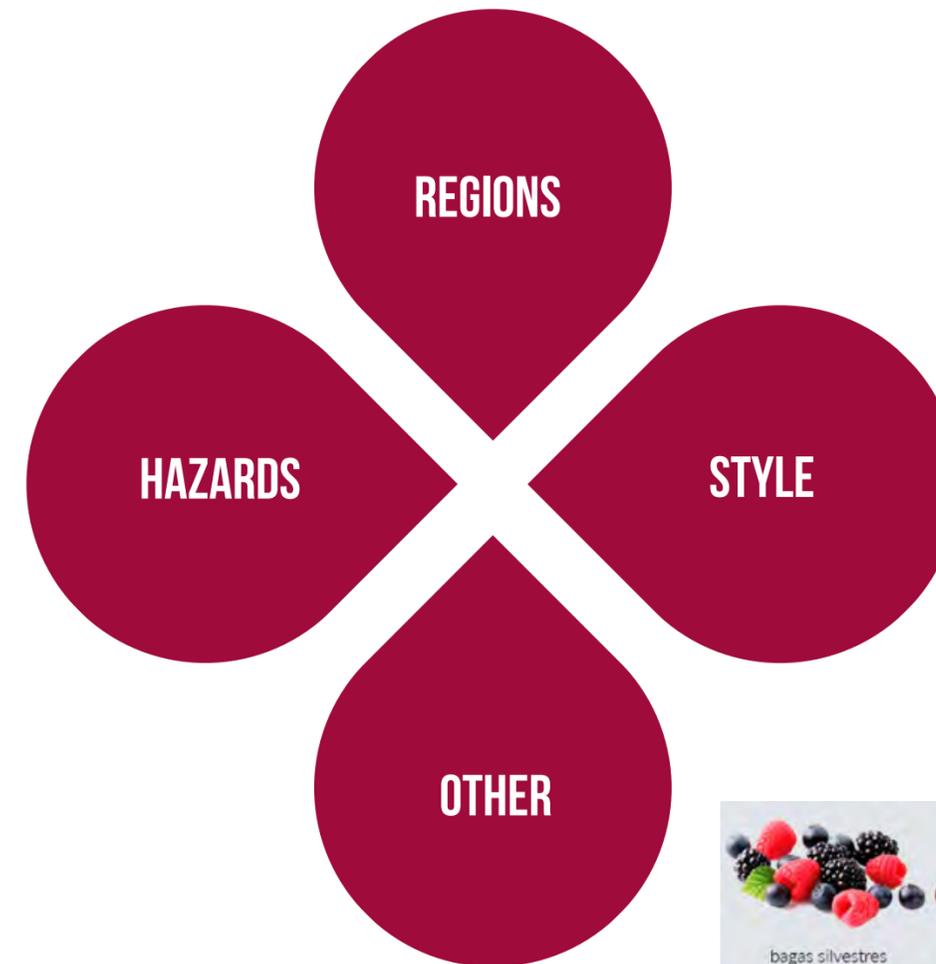
# BAGA

LATE RIPENING



- botrytis bunch rot

- PT, Bairrada: most planted black grape
  - labelled: 'Baga Clássico': min 50% Baga



- cranberry, cherry, plum fruit
- high acidity
- high tannins
- M body
- can be astringent when young, but becomes softer and more complex with bottle ageing
- traditionally: F on stems
- now destem, but return to whole-bunch or stem inclusion for greater structure / long ageing



- significant amount of high-yielding Baga sold for production of Mateus Rosé
- productive variety => limit yields to ensure full ripeness
- ripens best on limestone-clay soils: water retention ~ drainage

# Trentino, IT

## Teroldego



most common black variety

best wines:  
Teroldego Rotaliano DOC

## Marzemino



prone to botrytis bunch rot and powdery mildew

best wines: Ziresi subzone of Trentino DOC (full sun exposure; rich calcareous-clay and basalt soil)

## Lagrein

needs warm site with plenty of sunshine to ripen fully

deep colour; bitterness and harshness on finish is addressed by shorter maceration and oak ageing



## Nosiola

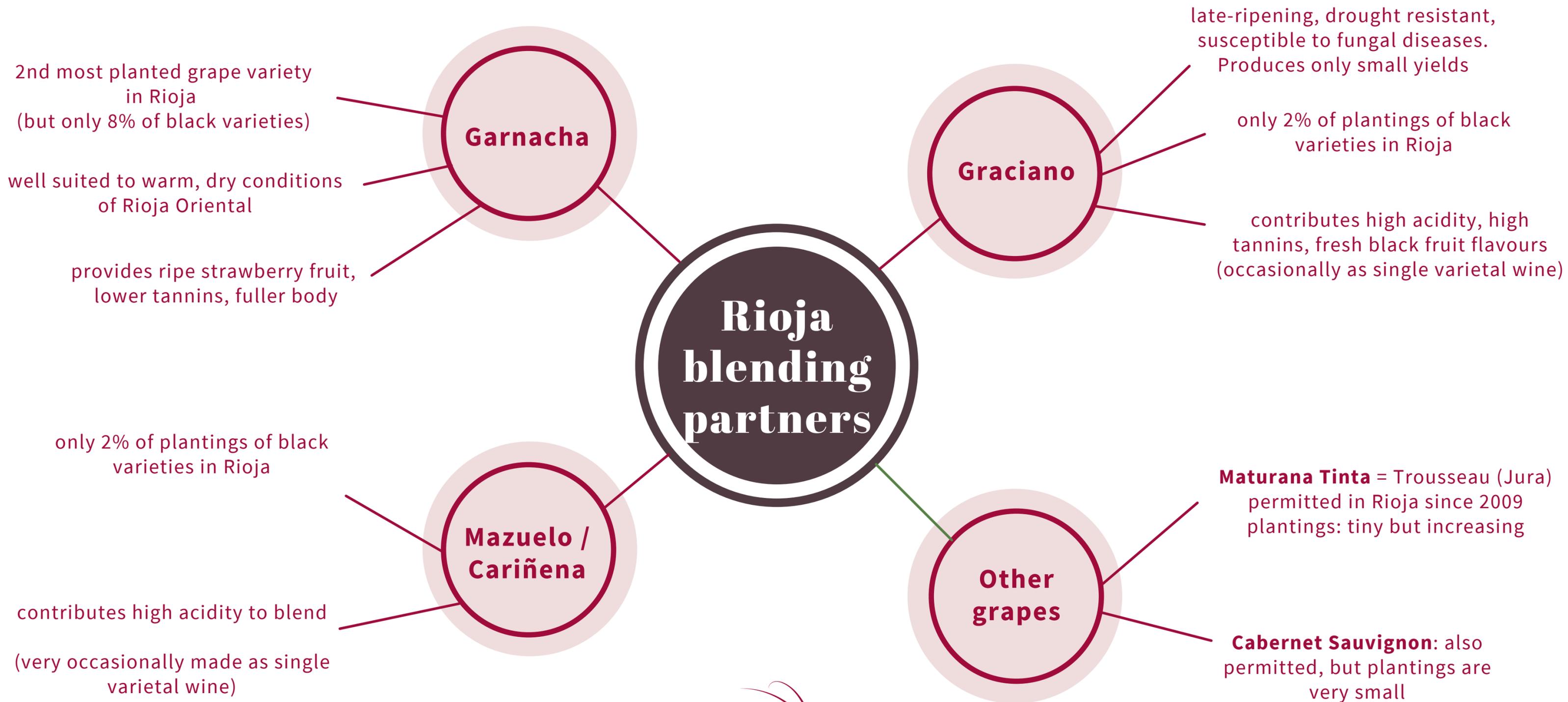
grown in Valley of the Lakes (warmest area, sub-continental climate)

distinctive white wines with light hazelnut flavour (from the fruit); mid-priced

also made in semi-dried fruit version: Vino Santo (premium-priced)





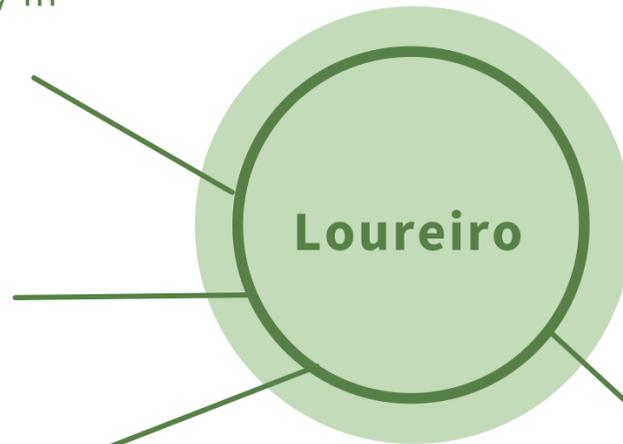




= Loureira in Rias Baixas, ES  
most widely grown grape variety in  
Vinho Verde

mid-ripening

M+ acidity; citrus, pear  
floral & herbal aromas



**Loureiro**



**Vinho  
Verde,  
PT**

= Albariño in Rias Baixas, ES

citrus, peach, sometimes tropical fruit  
M+ body; M+ to high acidity

traditionally mainly in north of  
Vinho Verde: Monção e Melgaço  
now: more plantings in other  
parts of the region



**Alvarinho**

3rd most planted grape variety,  
mid-ripening

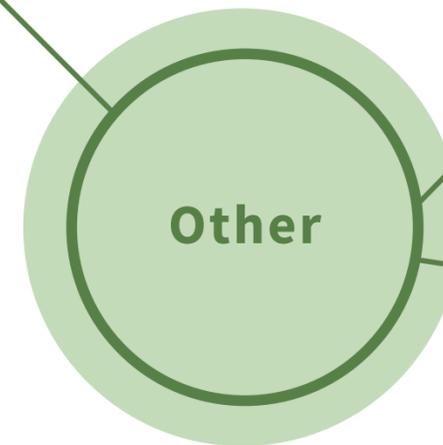
wines that are more neutral than  
Loureiro or Alvarinho; subtle  
citrus and apple fruit; high acidity



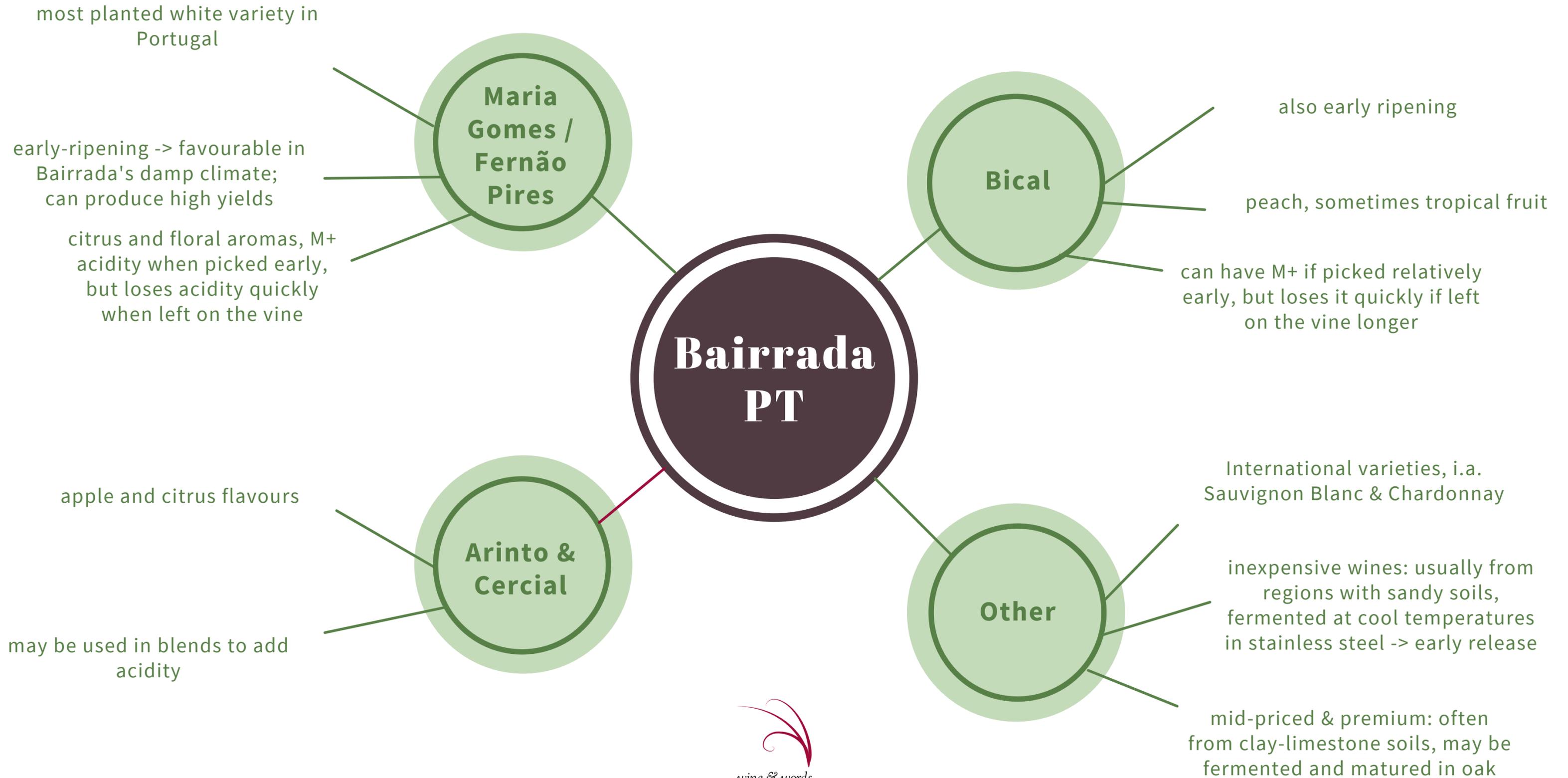
**Pedernã  
/ Arinto**

**Avesso:** late-ripening -> can fail to  
ripen unless warm and dry weather  
=> mainly grown inland, in Baião  
sub-region: warmer and drier.  
Lower in acidity, relatively full-  
bodied, citrus & stone fruit.

**Trajadura:** = Treixadura in Rias  
Baixas, ES. Low acidity, apple &  
peach flavours. Usually blended  
with higher acid varieties.



**Other**



# Alentejo PT

## Trincadeira

very susceptible to rot, but grows well in dry climate of Alentejo

M tannins, M acidity, blackberry & spice flavours

## Alicante Bouschet

red-fleshed grape, contributing deep colour, acidity, tannins & red / black fruit to blends

## Roupeiro

most planted white grape variety in Alentejo; retains acidity well -> well suited to warm, dry Alentejo

youth: citrus and stone fruit, but loses primary flavours quickly with age

## Antão Vaz

tolerant of drought = well suited to Alentejo's dry climate

made in range of styles:  
- early-picked fresh wines  
- later-picked fuller-bodied wines with tropical fruit (often oak-aged)  
- 'talha' wines: evident skin contact

can lack acidity in warmest sub-regions => often blended with e.g. Roupeiro, Arinto, ... -> higher acidity levels

# *Information and image sources*

[HTTPS://WWW.WSETGLOBAL.COM/](https://www.wsetglobal.com/)

[HTTPS://WWW.WINESPECTATOR.COM/WINE-IQ/KNOW-YOUR-GRAPES](https://www.winespectator.com/wine-iq/know-your-grapes)

[HTTPS://WWW.VINDEFRANCE.COM/WINES/GRAPE-VARIETIES-OF-FRANCE](https://www.vindefrance.com/wines/grape-varieties-of-france)

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[BOOK: WINE GRAPES \(VOUILLAMOZ, ROBINSON, HARDING\).](#)

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