

Winegrape
BERRY
SENSORY
ASSESSMENT
in Australia

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[w] winetitles



CONDUCTING BERRY SENSORY ASSESSMENT

Examining softness

The first assessment is to squeeze the berries lightly by exerting the same pressure to each berry. Do not break the berry as juice is needed for subsequent assessments.

Enter your score on the BSA Training Scoresheet.

	1	2	3	4
SOFTNESS <i>Squeeze the berry between the fingers</i>	> Hard berry > Bursts under strong pressure	> Elastic berry > Changes shape slightly under pressure but goes back to shape quickly	> Plastic berry > Changes shape easily, takes a while to go back to its shape	> Soft berry > Changes shape easily under light pressure, does not readily go back into shape



Examples of differing berry softness as described in the boxes above the photos.



Participants of the BSA workshop in Bunbury (WA) examining berry firmness.



Softness due to shrivel is an abnormal characteristic and is recorded separately.

Assessing the ease with which the stalk can be removed from the berry

This is an important criterion and needs to be done on all five berries.

- >> Grasp the berry with one hand and gently pull the stalk (pedicel) from the berry with the other hand.
- >> Assess how strongly you need to pull.

Look at the skin around the stalk insertion point of the berry: it can be torn out on unripe berries. Then look at the stalk: on unripe berries, you can see a piece of skin and a lot of green pulp attached to the stalk; in ripe berries no pulp remains on the stalk, just the “brush” is clearly visible.

In ripe red varieties, the brush displays a dark red colour.

	1	2	3	4
STALK REMOVAL <i>Remove berry from stalk (pedicel)</i>	<ul style="list-style-type: none"> > Berry strongly attached and/or > Stalk tears the skin, takes much green pulp and some skin out of berry 	<ul style="list-style-type: none"> > Berry comes off with moderate difficulty > Stalk comes off with part of the green pulp 	<ul style="list-style-type: none"> > Berry comes off fairly easily > Stalk and brush includes only a little of uncoloured pulp 	<ul style="list-style-type: none"> > Berry comes off very easily > Stalk and brush with no pulp stuck to them > Brush red in red varieties



Stalks of Chardonnay coming off with some skin (left), with part of the pulp (middle) and with only a little pulp (right).



Stalks of Shiraz coming off with part of the pulp (left), a little of uncoloured pulp (middle) and with no pulp and a red brush (right).

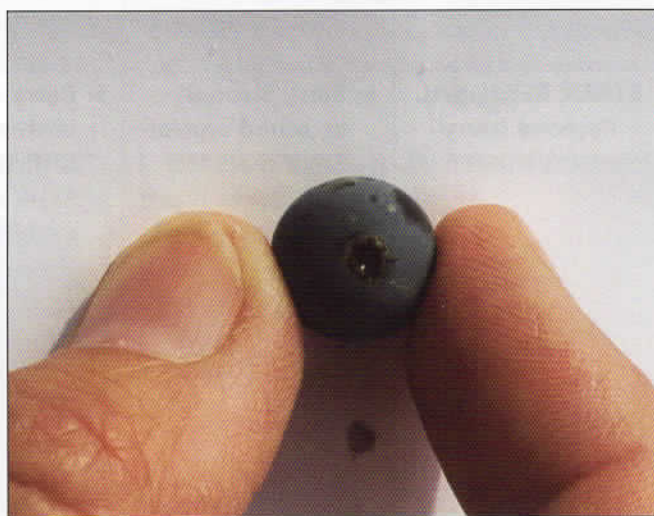
Examining the skin colour of red varieties

For red varieties look at the area of skin around where the stalk was removed. Fully ripe berries do not appear translucent when held up to the light.

	1	2	3	4
COLOUR RED VARIETY <i>Look at the stalk end</i>	> Pink, pale red	> Red, but light penetrates berries	> Dark red, but not evenly coloured around the stalk	> Blackish red, evenly coloured



Pink pale red (score 1) and light red (score 3) berries.



Blackish red, evenly coloured Shiraz berry (score 4).

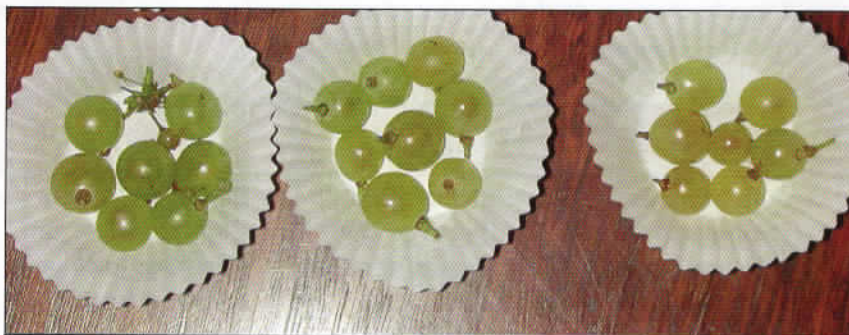


Earl Happ of Happs Vineyard and John Brocksopp of Leeuwin Estate investigating berry colour at a BSA workshop in Margaret River, WA.

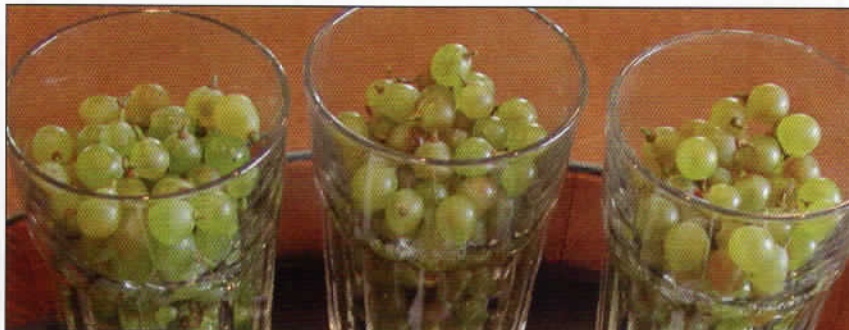
Assessing the skin colour of white varieties

In white varieties it may be worthwhile putting surplus berries of each maturity grade into a transparent glass or plastic cup and compare the colour of the three bulk samples side by side.

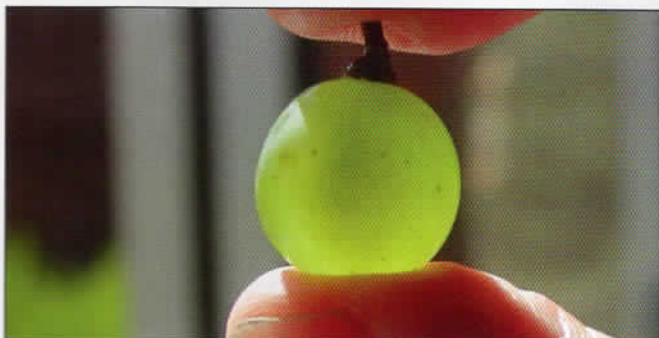
	1	2	3	4
COLOUR WHITE VARIETY Observe bulk sample	> Green	> Green yellow	> Straw yellow	> Amber yellow



Chardonnay of three degrees of ripeness (least ripe on the left).



Chardonnay of 3 degrees of ripeness (least ripe on left) with high variability in colour.



In Chardonnay a high degree of translucency of single berries is a sign of ripeness.

If you can't see the seed it's not ripe.

Examining pulp consistency

Place three of the berries into the mouth (repeat assessments are done as required).

- >> Extract the pulp by successively squashing each berry between the tongue and the roof of the mouth, and gently squash the skins between the teeth to extract the last bit of pulp (do not crush the skins or seeds)
 - >> Keep the 3 pulps in the mouth; resist the urge to swallow (some practice may be required to overcome this)
 - >> Spit out the skins and the seeds into the hand or napkin and keep them aside
 - >> Squeeze the juice from the pulp, completely squashing the pulp between the tongue and the roof of the mouth
 - >> Assess the ease with which the pulp detaches itself from the skin
 - >> Assess the juiciness of the pulp while squashing the pulp against the roof of the mouth
 - >> Look for the possible presence of pulp attached to the seeds
 - >> When the skins are assessed later by chewing, check for further release of juice from any pulp remaining on the skins
- Retain pulp and juice in the mouth for examining flavour and aroma (next page)

	1	2	3	4
Detachment of the pulp from the skin <i>Crush berries against the roof of the mouth to express juice, later slightly chew skins</i>	> pulp adheres strongly to the skin and seeds	> a film of pulp adheres to the skin and/or seeds	> film of pulp only slightly visible on skins but juice is released from skins when squashed	> no film of pulp on skin and seeds and no release of juice when squashed
Juiciness of pulp melting properties of juice in the mouth	> more than 80% is firm gelatine	> 50% gelatinous, 50% juicy	> almost all juice	> 100% juice

Abnormal characters would be that no pulp film is left on the skin, but the pulp adheres strongly to seeds, or ripe grapes having very gelatinous pulps. Australian pulps may be rather gelatinous, due to water stress or hot periods during the ripening phase.



Shiraz berries and seeds from 3 degrees of sugar ripeness. The left pulp and seed would be scored as 1, the right pulp and seed as 3.

Examining pulp sweetness, acidity and aromas

Mix the juice and pulp from the three berries in your mouth

- >> Assess the sweet and acidic tastes
- >> Assess the type and intensity of the aromas

Sweetness can be particularly sensed at the front of the tongue, acidity at the sides of the tongue.

Herbaceous characters cannot be sensed well with a head-cold and include grassy or hay, and capsicum or asparagus aromas. In unripe grapes, the intensity of herbaceous aromas is high, and they dissipate or disappear at full ripeness. In herbaceous varieties (e.g. Sauvignon Blanc or Cabernet Sauvignon), the herbaceous character may still be detectable at full ripeness.

	1	2	3	4
Sweetness <i>move juice over tongue</i>	> not very sweet	> moderately sweet	> sweet	> very sweet
Acidity <i>feeling on the side of the tongue</i>	> very acidic	> acidic	> moderately acidic	> low acid
Herbaceous aromas <i>analysis in the mouth</i>	> intense	> moderate	> weak	> absent
Fruity aromas <i>analysis in the mouth</i>	> absent	> weak	> moderate	> intense



Chardonnay at three degrees of sugar ripeness with moderately ripe and rather ripe seeds but gelatinous pulp at all three stages of sugar ripeness.

Examining skin disintegration

Before examining the skin, swallow or spit out the juice and pulp. For a short training exercise swallowing the pulp and juice is acceptable but if many samples are to be tasted, as in the field, it is best to spit.

- >> Place three skins only (not the seeds) in the mouth.
- >> Chew the skins 10 to 15 times, use a consistent number of chews for the assessment of all samples. While chewing, evaluate how easily the skin disintegrates between your teeth.

If it is difficult to break up the skins then the skin is unripe. Ripe grapes have a skin that is very easy to chew and may even produce a mix of skin and saliva.

	1	2	3	4
Disintegration <i>Chew the skins 10 to 15 times</i>	> Very difficult > Big pieces	> Difficult > Small pieces	> Fairly easy > Mixture almost homogenous	> Easy > Homogenous mixture



Skins of Chardonnay from a warm region chewed 15 times and spat out on paper. Australian grape skins are quite hard and often fall into categories 1 (left example) or 2 (right example).

Examining skin acidity and aromas

- >> Evaluate the acidity of the skin. Intense levels of acidity are usually detected early in the chewing process and lower levels appear later.
- >> Assess the type of herbaceous and fruity aromas in the skin and their intensity. Intense levels of herbaceousness are usually detected early in the chewing process and lower levels appear later.

	1	2	3	4
Acidity <i>of chewed skins</i>	> Very acidic	> Acidic	> Moderately acidic	> Low acid
Herbaceous aromas <i>of chewed skins</i>	> Intense	> Moderate	> Weak	> Absent
Fruity aromas <i>of chewed skins</i>	> Absent	> Weak	> Moderate	> Intense

Examining skin tannic intensity

This measures phenolic quantity

- >> Rub the crushed mixture of skins between the tongue and the roof of the mouth.
- >> Put the crush to one side of the mouth and leave it there.
- >> Immediately, run the tongue twice along the roof of the mouth from the back to the front and during the second time evaluate the friction force to rate the tannic intensity or quantity.

In skins with a low phenolic or “tannin” quantity, the tongue slides effortlessly over the roof of the mouth. In skins with high amounts of tannins, it is difficult to move the tongue over the roof of the mouth.

In the skins, phenolic extractability increases during ripening as the skin integrity is diminished in the later ripening stages. In some vineyards and with some varieties e.g. in Viognier, tannic intensity is naturally high, but in others tannic intensity does not reach a high level e.g. in Chardonnay. Increased tannic intensity has been found in water stressed vineyards in the Montpellier region.

	1	2	3	4
Tannic Intensity <i>Run the tongue over the palate</i>	> Tongue slides effortlessly over the roof of the mouth	> Tongue sticks slightly to the roof of the mouth	> Tongue slides over roof of the mouth with difficulty	> Tongue slides over roof of the mouth with great difficulty

Examining skin tannic astringency

- >> Spit out the crushed skins.
- >> Evaluate the tannic astringency and grain size in the mouth.

Astringency is a puckering feeling which is caused by the reaction of the phenolics with the mucous membranes of your mouth. An example of high astringency taste is an unripe persimmon.

After a few seconds assess how long it takes to re-salivate the mouth. Aggressive tannins will denature many of the salivary proteins in the mouth. In riper skins, tannins have already bound to proteins and polysaccharides in the grapes and do less harm to your salivary capacity.

	1	2	3	4
Grain size and Astringency of tannins <i>Spit the skins out, assess astringency and time needed to re-salivate</i>	> Grippy, rough, aggressive > Difficult to re-salivate after more than 5 seconds	> Coarse size grains > Difficult to re-salivate for a few seconds	> Medium size grains > A little difficult to re-salivate	> Soft, fine and silky grains > Not difficult to re-salivate

Examining seed colour

>> Remove any traces of the skin from the mouth and examine the seed colour, particularly at the ventral, flat front part, where it ripens slower.

Any green traces or not!

	1	2	3	4
Colour <i>At front of seed</i>	> Green, yellow-green	> Brown-green	> Grey-brown, no green traces	> Dark brown



Seeds of Pinot Noir, upper row ventral (front) side, lower row round dorsal (back) side. The seeds on the left would score 1, in the middle score 2 and on the right score 4.

Assessing seed moisture and crushability

- >> Place all seeds back into the mouth.
- >> If seeds are fully or largely green, lick them gently with your tongue. If the feeling is too astringent do not crush them, or they will numb your mouth.
- >> If the seeds are not green, crush the seeds with the front teeth and observe the crushability of the seeds.

In unripe berries the seeds have a slippery layer on them and squash without any crunching. As seeds ripen they become crunchier and shatter more easily.

	1	2	3	4
Crushability <i>Crush the seeds between the front teeth</i>	> All seeds are soft	> Outside layer is soft > Seed crushes under the pressure like a fresh almond	> Almost no soft outside layer > Most seeds are hard and crack easily	> No soft outside layer > All seeds are hard, crack quickly and are crunchy



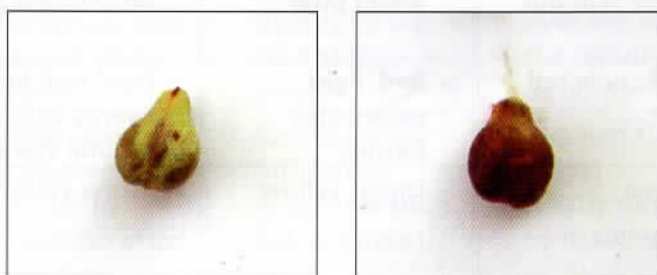
Crushed seeds of Shiraz at ripeness stage 2 (left) and 4 (right).

Assessing seed flavours

- >> In order to assess flavours and tannins, chew the seeds until the astringency becomes too high.
- >> If seeds were previously judged too astringent to chew, score them as 1 and unripe.

As grapes ripen, the flavours change from herbaceous to toasted. Toasted flavours are described as similar to toasted bread.

	1	2	3	4
Flavours <i>Of crushed chewed seeds</i>	> Not tasted	> Herbaceous	> Only slightly herbaceous and slightly toasted	> Toasted



Seeds which will taste herbaceous (left) and toasted (right).

Examining seed tannic astringency

- >> Tannic astringency in the seeds may be assessed first by licking the seeds, and then, if not excessive, seeds may be chewed.

Astringency is a mouthfeel of aggressiveness and is sensed after spitting. It can be felt on the tongue and if the tongue touches the lips the astringency can be transferred to the lips.

	1	2	3	4
Astringency <i>First lick, then, if possible, chew the seeds</i>	> Very astringent when licked	> Astringent when chewed	> Moderately astringent when chewed	> No astringency

Examining seed tannic intensity

- >> Rub the tongue over the roof of the mouth and assessing how easily it slides.

In seeds with high amounts of soluble tannins, which is often the case in less ripe seeds, the tongue slides with difficulty over the roof of the mouth. This changes to an easier tongue movement in riper seeds where tannins are not as extractable.

	1	2	3	4
Tannic intensity <i>Run the tongue over the roof of the mouth</i>	> Tongue slides with great difficulty	> Tongue slides with difficulty	> Tongue sticks slightly	> Tongue slides effortlessly

SENSORY CRITERIA CHART

Visual and tactile examination of the grapes

	1	2	3	4
SOFTNESS <i>Squeeze the berry between the fingers</i>	> Hard berry > Bursts under strong pressure	> Elastic berry > Changes shape slightly under pressure but goes back to shape quickly	> Plastic berry > Changes shape easily, takes a while to go back to its shape	> Soft berry > Changes shape easily under light pressure, does not readily go back into shape
STALK REMOVAL <i>Remove berry from stalk (pedicel)</i>	> Berry strongly attached and/or > Stalk tears the skin, takes much green pulp and some skin out	> Berry comes off with moderate difficulty > Stalk comes off with part of the green pulp	> Berry comes off fairly easily > Stalk and brush includes only a little of the uncoloured pulp	> Berry comes off very easily > Stalk and brush with no pulp stuck to them > Brush red in red varieties
COLOUR RED VARIETY <i>Look at stalk end</i>	> Pink, pale red	> Red, light penetrates berries	> Dark red, but not evenly coloured around the stalk	> Blackish red, evenly coloured
COLOUR WHITE VARIETY <i>Bulk Sample</i>	> Green	> Green yellow	> Straw yellow	> Amber yellow

Pulp characteristics

	1	2	3	4
DETACHMENT OF THE PULP FROM THE SKIN <i>crush berries against roof of the mouth to express juice, later slightly chew skins</i>	> Pulp adheres strongly to the skin and seeds	> A film of pulp adheres to the skin and/or seeds	> Film of pulp only slightly visible on skins but juice is released from skins when squashed	> No film of pulp on skin and seeds and no release of juice when squashed
JUICINESS OF PULP <i>melting properties of juice in the mouth</i>	> More than 80% is firm gelatine	> 50% is gelatinous and 50% juicy	> Almost all juice	> 100% juice
SWEETNESS <i>move juice over tongue</i>	> Not very sweet	> Moderately sweet	> Sweet	> Very sweet
ACIDITY <i>feeling on the side of the tongue</i>	> Very acidic	> Acidic	> Moderately acidic	> Low acid
HERBACEOUS AROMAS <i>analysis in the mouth</i>	> Intense	> Moderate	> Weak	> Absent
FRUITY AROMAS <i>in the mouth</i>	> Absent	> Weak	> Moderate	> Intense

Skin characteristics

	1	2	3	4
DISINTEGRATION <i>chew the skins 10 to 15 times</i>	> Very difficult > Big pieces	> Difficult > Small pieces	> Fairly easy > Mixture almost homogeneous	> Easy > Homogeneous mixture
ACIDITY <i>of chewed skins</i>	> Very acidic	> Acidic	> Moderately acidic	> Low acid
HERBACEOUSNESS AROMAS <i>of chewed skins</i>	> Intense	> Moderate	> Weak	> Absent
FRUITY AROMAS <i>of chewed skins</i>	> Absent	> Weak	> Moderate	> Intense
TANNIC INTENSITY <i>run the tongue over the palate</i>	> Tongue slides effortlessly over the roof of the mouth	> Tongue sticks slightly to the roof of the mouth	> Tongue slides over the roof of the mouth with difficulty	> Tongue slides over the roof of the mouth with great difficulty
GRAIN SIZE AND ASTRINGENCY OF TANNINS <i>spit the skin out, assess astringency and time needed to re-salivate</i>	> Grippy, rough, aggressive > Difficult to re-salivate after more than 5 seconds	> Coarse grains > Difficult to re-salivate for a few seconds	> Medium size grains > A little difficult to re-salivate	> Soft, fine and silky grains > Not difficult to re-salivate

Seed characteristics

	1	2	3	4
COLOUR <i>at front of seed</i>	> Green, yellow-green	> Brown-green	> Grey-brown, no green traces	> Dark brown
CRUSHABILITY <i>crush the seeds between the front teeth</i>	> All seeds are soft	> Outside layer is soft > Seed crushes under pressure like a fresh almond	> Almost no soft outside layer > Most seeds are hard and crack easily	> No soft outside layer > All seeds are hard, crack quickly and are crunchy
FLAVOURS <i>of crushed chewed seeds</i>	> Not tasted	> Herbaceous	> Only slightly herbaceous, slightly toasted	> Toasted
ASTRINGENCY <i>first lick, then, if possible, chew the seeds</i>	> Very astringent when licked	> Astringent when chewed	> Moderately astringent when chewed	> No astringency
TANNIC INTENSITY <i>run the tongue over the roof of the mouth</i>	> Tongue slides with great difficulty <i>concrete</i>	> Tongue slides with difficulty	> Tongue sticks slightly	> Tongue slides effortlessly <i>-silk</i>

Vineyard:	BSA FIELD SCORESHEET				Decision	Notes (abnormal)
	Taster: _____					
Date : ___/___/___						
Sample 1:	Maturity level				Decision	Notes (abnormal)
	1	2	3	4		
Pulp maturity						
Pulp aromatic level						
Skin maturity						
Seed maturity						
Sample 2:	Maturity level				Decision	Notes (abnormal)
	1	2	3	4		
Pulp maturity						
Pulp aromatic level						
Skin maturity						
Seed maturity						
Sample 3:	Maturity level				Decision	Notes (abnormal)
	1	2	3	4		
Pulp maturity						
Pulp aromatic level						
Skin maturity						
Seed maturity						
Sample 4:	Maturity level				Decision	Notes (abnormal)
	1	2	3	4		
Pulp maturity						
Pulp aromatic level						
Skin maturity						
Seed maturity						
Sample 5:	Maturity level				Decision	Notes (abnormal)
	1	2	3	4		
Pulp maturity						
Pulp aromatic level						
Skin maturity						
Seed maturity						
Sample 6:	Maturity level				Decision	Notes (abnormal)
	1	2	3	4		
Pulp maturity						
Pulp aromatic level						
Skin maturity						
Seed maturity						

BSA Training Scoresheet

Vineyard:

Variety:

Taster :

Date : __/__/__

First batch

Second batch

Third batch

Visual and tactile observations

Berry	Softness	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Stalk removal	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
	Colour	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

Tasting

Pulp	Detachment of pulp from skin	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	
		Juiciness of pulp	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Sweetness	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Acidity	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Herbaceous aromas	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Fruity aromas	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Skin	Disintegration	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	
		Acidity	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Herbaceous aromas	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Fruity aromas	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Tannic intensity	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Astringency	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Seeds	Colour	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	
		Crushability	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Flavours	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Astringency	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
		Tannic intensity	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

BSA in the field

In vineyards, or when a quick decision needs to be taken with samples from the field, e.g. before laboratory analysis of sugar, acid or pH, it can be difficult to make a complete and precise judgement for each of the 20 criteria.

A shorter field assessment sheet has been developed by the ICV and adapted herein for Australian conditions.

A 4-level assessment scale was chosen so that there cannot be any middle score. Scores of 1 and 2 mean that grapes have not reached a sufficient maturity. Scores of 3 and 4 mean that the grapes have reached a sufficient degree of maturity.

In the FIELD SENSORY CRITERIA CHART berries are described according to

- > **the balance between sweetness and acidity of the pulp**
- > **the aromas of the pulp**
- > **the skin maturity**
- > **the seed maturity**
- > **abnormal characteristics**

Even if using the BSA Field Scoresheet, it is recommended to do the BSA training procedure first.



Autumn in Ashbrook Estate, WA.

If the berries are very similar across the area to be harvested, then only a small sample is required to provide a representative result. Where the variability between vines or berries is high, a much larger sample is required.

There are many modern ways to assess vineyard variability, e.g. by remote sensing or from yield maps. If the vineyard has some distinct patchiness with, for example, lower lying and hilly parts or several soil types, it is wise to subdivide the vineyard and do a field assessment in each part of the subdivision.

Assessing the variability in your vineyard

In order to know how many times a Field BSA is to be performed per vineyard, the variability between vines and bunches may need to be assessed.

The variability of berry sensory traits has not been studied. However, Krstic et al. (2003) have shown that in relatively uniform vineyards of inland Australia, the variability between bunches differed for various measurable criteria (5-9% for sugar concentration and 7-17% for acidity).

Assuming 12% variability for berry sensory criteria, (yet to be determined), and aiming at a confidence level of 95% with an acceptable error of 10% it is advisable to assess grapes from at least 6 bunches.

To reduce the error to 5%, 23 bunches would need to be sampled for BSA analysis. For further information see Dunn and Martin, 1998.

Random selection of samples

While adequate sample size is important, it is also important to sample correctly.

Random sampling requires a table or list of randomly generated numbers in order to select a row number and then a vine number in that row.

This is suitable for management units that are approximately square or rectangular in shape. Triangular or other odd-shaped vineyards require the area to be broken up into equal size sub-units followed by random selections within each unit.

Selecting berries

>> Once a bunch is selected, randomly pick five berries per bunch using the 2:2:1 process:

2 from near the top of the bunch

2 from the middle, front and back side

1 from near the bottom of the bunch.

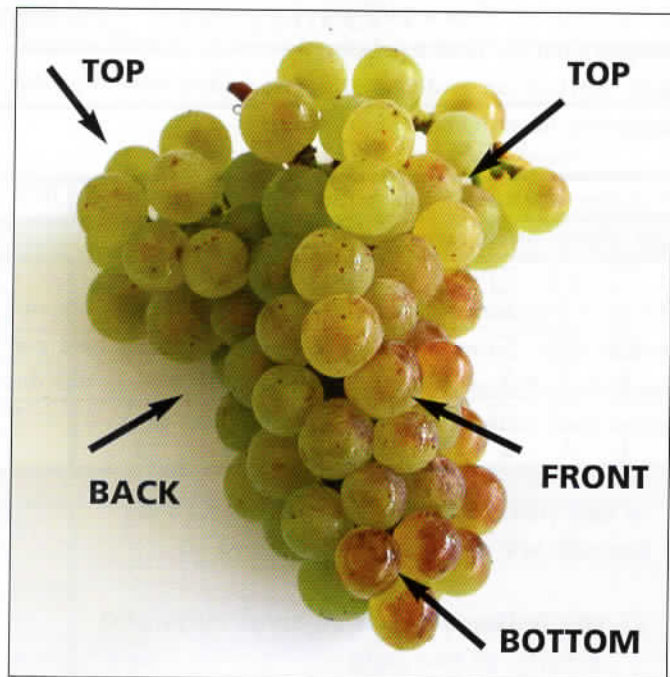
>> Ensure a mix of berries come from the front, sides and back of the bunch. Be aware that less ripe berries may be present in the inner part of large or tight bunches, and select some of those.

>> Carefully remove berries from the bunch without squashing the juice out of them. If squashing is a problem, use fine pointed (embroidery) scissors to cut the berries off with pedicels intact.

>> Ensure that the temperature of the grapes is similar in each assessment, particularly if assessments are made at weekly intervals or in different vineyards.

Using the Field BSA Scoresheet

Again, for the ease of photocopying, the scoresheet can be cut out from the back of the book (page 63).



Arrows indicate where to sample using the 2:2:1 process.

Important for applying BSA in the field

- > **Assess the pulp, skin and seeds separately according to the Field Sensory Criteria Chart (page 46)**
- > **Match up the description of the berries with the closest score (1, 2, 3 or 4)**
- > **Record results on the copies of the BSA Field Scoresheets (pages 47 or 63)**

When to use BSA in the field

There is no point in doing BSA just after veraison. Berries are unripe, and can be very aggressive for the lining of the mouth.

- > **It is advisable to start at 1 or 2 °Brix below the target sugar level.**
- > **In a warmer climate, where there is a danger of aroma loss if harvested too late, it can be wise to start 2 °Brix before the target sugar level.**

How often to use BSA

- >> In warmer climates and on exposed bunches the speed of maturation may make it necessary to do an assessment every 3 days.
- >> In other situations weekly or fortnightly assessments have been found to be sufficient.

How to store the data

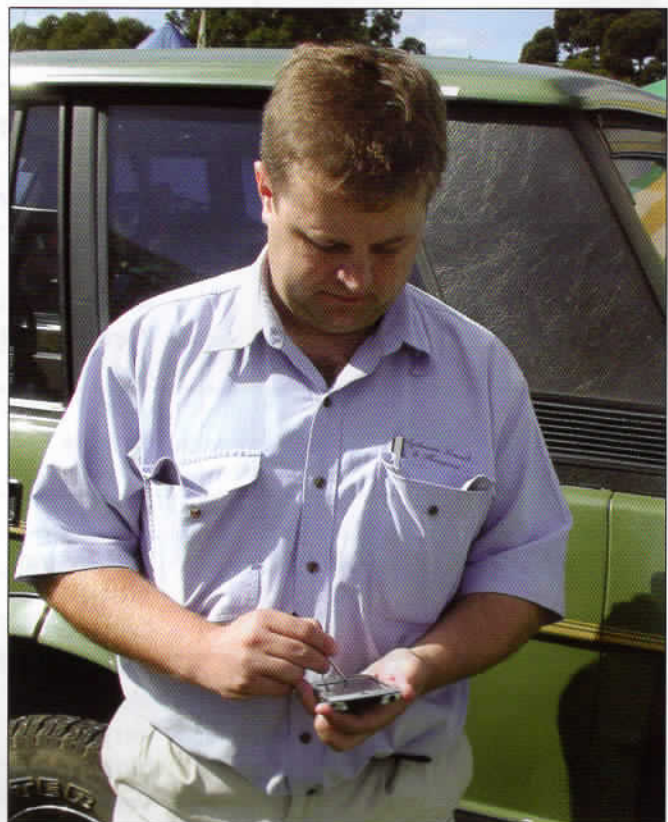
The data can be entered into folders, portable computers, data spreadsheets, etc. to compare data within blocks and between sites and years for each variety:

How to use the data

- > **Just prior to crushing, undertake the full Berry Sensory Assessment on the fruit to be crushed**
- > **After winemaking is completed compare BSA on different batches of fruit with the completed wines. Note any relationships between BSA and high or low quality attributes in the wine**
- > **Repeat over several seasons to establish a more complete picture of the relationships between BSA and wine quality**



Merlot in a warm climate vineyard.



BSA data have been entered into a palm-pilot by Steven Partridge from ARM, Manjimup, WA.

FIELD SENSORY CRITERIA CHART

MATURITY LEVEL					
	1	2	3	4	Abnormal Characters
PULP TECHNOLOGICAL MATURITY	<ul style="list-style-type: none"> > Very acidic pulp > Pulp not sweet > Gelatinous pulp 	<ul style="list-style-type: none"> > More acidic than sweet > Gelatinous pulp, some pulp adherent to skin and seeds 	<ul style="list-style-type: none"> > Pulp more sweet than acidic > Pulp quite juicy and with little adherence to skin 	<ul style="list-style-type: none"> > Pulp very sweet > Very low acidity > Juicy pulp > No pulp adherent to skin and seeds 	<ul style="list-style-type: none"> > Pulp both not very sweet and not very acidic > Sweet but gelatinous, adherent to seeds > Pulp both very sweet and acidic
PULP AROMATIC MATURITY	<ul style="list-style-type: none"> > Intensely herbaceous not fruity 	<ul style="list-style-type: none"> > More herbaceous than fruity 	<ul style="list-style-type: none"> > More fruity than herbaceous 	<ul style="list-style-type: none"> > Very fruity not herbaceous 	<ul style="list-style-type: none"> > Mouldy taste > Vinegar (acetic acid) taste > Black tea > Overcooked fruit
SKIN MATURITY	<ul style="list-style-type: none"> > Green colour in white varieties, pink colour in red varieties > Very hard to chew > Intensely herbaceous > Very acidic > Aggressive tannins 	<ul style="list-style-type: none"> > Some green colour in white varieties or weakly coloured near the stalk in red varieties > Moderately hard to chew > Moderately herbaceous > Acidic > Weakly fruity > Astringent, coarse grain tannins 	<ul style="list-style-type: none"> > Some yellowing in white varieties and uniform red colour near the stalk in red varieties > Quite crushable > Moderately fruity and acidic > Weakly herbaceous > Moderately astringent 	<ul style="list-style-type: none"> > Uniform colour in all varieties, in some red varieties strong colour extraction when rubbed between fingers > Crumbly texture > Intensely fruity > Weakly acidic > Not herbaceous > Weakly astringent 	<ul style="list-style-type: none"> > Uneven colour > Sunburn > Shivel > Damage (insect, bird etc.) > Very thin skin > Skin crumbly but herbaceous > Mouldy or muddy taste > Salty taste > Taste of ashes or dust
SEED MATURITY	<ul style="list-style-type: none"> > Mainly green, soft seeds > Astringent when licked 	<ul style="list-style-type: none"> > Brown and green > Crush under pressure like almond > Very herbaceous > Very astringent when chewed 	<ul style="list-style-type: none"> > Mainly grey-brown no green traces > Most seeds are hard and crack > Only slightly herbaceous > Moderately astringent 	<ul style="list-style-type: none"> > Dark brown > All seeds hard and crack quickly > Toasted aromas > No herbaceous aromas > Not astringent 	<ul style="list-style-type: none"> > Dark brown seeds and hard, herbaceous or acidic skin > Unripe seeds but ripe pulp and skin > Very little pulp and many seeds