Importance of Grape Quality on Wine Production

Western Iowa Grape Growers Association

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YOU CANNOT MAKE GOOD WINE WITH BAD GRAPES

Focus on quality is crucial for wineries to make good wine.

The three most important things you must do:

1. Canopy management and proper crop load
2. Address issues quickly and focus on prevention
3. Monitor(pH, TA, ^{o}Brix) grapes frequently during the last four weeks before harvest

Important factors

- Contaminants and spoilage
- pH
- Sugar
- TA (titratable acidity)
- Even ripeness
- Nitrogen available to yeast (YAN)
- Potassium concentration
- Berry size and color

Issue	How to measure	Acceptable Range (desired value)	Effect on resulting wine if outside range
Spoilage	Eyes, nose, lab	Zero (0)	Infest winery, gives wine vinegar, barnyard and/or other bad smells and tastes; often makes wine unacceptable -> dump wine
Contaminants	Eyes, nose, lab	Zero (0)	Can ruin wine, may make wine illegal to sell
pH	pH meter, lab	2.5-3.5 (<3.0)	High pH will cause wine to spoil, sulfur dioxide won't work; color, flavor

Issue (contd.)	How to measure	Acceptable Range (desired value)	Effect on resulting wine if outside range
TA	Titration, lab	6-10 g/L (8 g/L)	5 g/L minimum required by law, lower TA decreases stability and shelf life, high TA will make wine taste sour and unpleasant;
Even Ripeness	Eyes, taste, lab	All ripe	Sour taste from higher malic acid content
Nitrogen	Lab		Low nitrogen causes stuck fermentation; too much nitrogen causes defects
Potassium (K)	Lab		High potassium increases pH and causes crystal formation in the bottle
Size and color	Eyes, lab	Small berries, deep color	Bigger berries contain more water and make weaker wine, color very important for red wines

Issue	What the grower can do	What the wine maker can do
Spoilage	Spray; canopy management; don't overcrop; trim/discard spoilage	Not buy the grapes or dump them; acetic acid can be lowered ($$$$$$$)
Contaminants	Keep fuels and oils out of vineyard; adhere to spraying requirements; use care during harvest	Not buy the grapes or dump them
pH	Track pH over last four weeks; canopy management, reduce crop load	Add tartaric acid to bring pH down
Sugar	Track ^{o}Brix over last four weeks; canopy management, reduce crop load	Add sugar to increase ^{o}Brix
TA	Track TA over last four weeks; canopy management	Add tartaric acid if TA is too low, Deacidify if TA is too high ($$$)
Even Ripeness	Keep eyes on crop to ensure even riping and use canopy management to adjust, reduce crop load	Add sugar and/or tartaric acid to increase ^{o}Brix and TA
Nitrogen	Nutrient supplement and canopy management	Add DAP (Diamonium Phospate) to increase nitrogen content
Potassium (K)	Minimize potassium fertilization especially after berry set, canopy management	Precipitation of potassium bitartrate ($$, can be difficult, raises pH)
Size and color	Regulated deficit irrigation and canopy management, reduce crop load	Make ice-wine, sell weak wine

What do different parameters mean?

pH

- Measure of acidity from hydrogen ion concentration
- Lower pH prevents spoilage
- Measure using a pH meter
- Influenced by organic acids (TA), potassium, nitrogen, canopy, crop load, berry size, and variety

^{o}Brix

- Measures the amount of soluble solids in juice
- More than 90% of soluble solids are sugar
- Used to predict alcohol concentration in resulting wine
- Measure with a refractometer or hydrometer
- Influenced by nutrition, canopy, crop load, and irrigation

Titratable Acidity

- TA is a measure of the organic acid content in juice and wine
- Tartaric and malic acid dominate
- Reported in g/L of tartaric acid
- Highest at veraison
- Measured by titration with 0.1 N sodium hydroxide
- Influenced by potassium, nitrogen, canopy, crop load, and irrigation

Contaminants

- Matter other than grapes (MOG) like vines, leaves, grass, insects, wires, and cigarette butts
- Pests and taints
- Oils and fuel
- Chemicals such as bug spray and pesticides sprayed too close to harvest
- Multiple grape varieties and unripe grapes

Spoilage

- Mildew
- Bunch rot
- Acetification
- Fermentation

Midwest Grape & Winery Industry Institute Laboratory Services
Prices reflect a 50% discount for WIGGA members (applicable for 2008 only)

Test	pH	TA	^{o}Brix	Nitrogen (YAN)	Potassium
$	6	7.50	10	20	10