

Winemaking Case History

2012 Western Iowa St. Croix

Fruit source: Doug Grave, [Victorian Vineyards](#), Glenwood, Iowa (Loess Hills).
Took delivery of approx.. 500 lbs. (10x6-gal pails crushed/destemmed at VSC) on Saturday, 8/4/2012. Ripe, healthy, delicious fruit. KMETA solution added (50 PPM).

Stylistic goals: Looking to achieve some complexity and as much structure as possible given the potential of Midwest hybrid red grapes. No enzymes used as cap disintegrated last time...and color extraction is not a problem with St. Croix.
The grapes were divided into three batches and fermented using different yeasts in order to increase complexity.

Prefermentation numbers: BRIX = 18 TA = 6.5 g/L pH = 3.78 YAN = 240 mgN/L (formol)

BATCH "L"

22.5 gallons/85L (in Brute fermenter); estimated 13.5 gal (51L) of finished wine given 60% press yield
Estimated final TA = 10.7 g/L (assuming all acid in must transferred to finished wine)
Possible High pH/High TA problem. [Why was estimated finished TA level so far off?](#)

Yeast selection: GRE ([morewinemaking.com](#))
Punched-down 3X daily

Sat., 8/4 5 PM

Chapitalization to 22.5 Brix target level

Lbs sugar/gal = $0.125(\text{Target Brix}-\text{Original Brix})=0.125(22.5-18)=0.5625$ lbs/gal

Total sugar addition = 13.5 gal finished wine x 0.5625 lbs/gal = 7.6 lbs (Added as syrup)

Final value following Chapitalization:

BRIX=21; Temperature=71F (Starting spreadsheet values)

[Note: Under-chapitalized same as last year...This formula needs to be revised.](#)

[This was fortunate, however, as the final 11.8% ETOH resulted in a harmonious wine.](#)

Oak Addition to Fermenter: 4.5 oz. American oak chips (dose: 1 oz. per 5 gal. must)

Sat., 8/4 8:30 PM

Yeast addition

3 x 8g **GRE yeast**; 20g **GO-FERM**; standard rehydration protocol with temp. equilibration

Yeast nutrient (Fermaid K) Calculation

Given YAN=240...need to bump up by 60 PPM

$60 \text{ PPM}/0.13 = 462 \text{ mg/L}$ Fermaid-K; 85L must x 0.462g = 39g Fermaid-K Total addition

Due to high pH and possible microbial instability decided to half **Fermaid add to 20g Total**

Half to be added at end-of-lag-phase and the other half at 1/3 sugar depletion (see below)

[Next time bump YAN all the way to 300 PPM \(due to "egginess"\)](#)

OptiRed Addition 1g/gal x 22.5 gal = 22g OptiRed added

Sun., 8/5 Noon **First Fermaid-K addition (10g)**

Sun., 8/5 10PM RBRIX=19 True Brix=17.2 SG=1.071

Mon., 8/6 9AM RBRIX=15 True Brix=10.8
Second Fermaid-K addition (10g)

Mon., 8/6 9PM
11PM RBRIX=10 True Brix=2.6 SG=1.01 Temp=78F
Pitched malolactic (Viniflora + ActiML)
MLF preparation notes:
Warmed 250 ml distilled to 77F; mixed in 50g ActiML;
Added 2.5g Viniflora Oeni (total volume now 300ml)
Waited 15 min; Added 100 ml to each of three fermenters

Wine has been somewhat “eggy” all day....Very fast fermentation!

Tues., 8/7 8AM RBRIX=7.5 True Brix=-1.5 SG=0.994
Still somewhat “eggy”

10PM **Pressed to 3 x 5gal carboys**

Wed., 8/8 9PM Racked-off gross lees
A little egginess at racking; no need for H₂S treatment at this time
(but subsequently treated with 0.5 g/gal Redulees prior to Flextank xfer)
5gal/5gal/3gal/1gal glass containers under air-lock
Total press yield of **14 gal** (62% press yield)

pH = 3.88 (up by 0.1; dangerous microbial instability problem)

Sensory notes:
This wine tastes/smells like a “wet ashtray” on the front with a strong
flavor of tobacco on the finish. There is some fruit trying to break through.
At this point, the winemaker doesn’t know what to make of this and is
quite pessimistic about the future of this wine. Fortunately, as will
be noted below, things turn-out much better than currently expected .

Sun., 8/12 paper chromatography indicates plenty of malic acid still present (see below)

Tues., 8/14 All wine transferred to 30 gal Flextank along with other batches of St. Croix.

BATCH "R"

22.5 gallons/85L (in Brute fermenter); estimated 13.5 gal (51L) of finished wine given 60% press yield
Punched-down 3X daily.

Chapitalization; Oak/Fermaid-K/OptiRed additions all the same as for Batch "L"

Switched from GRE to 3 x 8g **D254 yeast** to add some complexity.

Starting values: RBRIX=21; Temperature=71F

Sun., 8/5 10PM	RBRIX=19	True Brix=17.2	SG=1.071
Mon., 8/6 9AM	RBRIX=16	True Brix=12.4	
	Second 10g Fermaid-K addition. Wine just a bit stinky but blows-off easily.		
Mon., 8/6 9PM 11PM	RBRIX=10.5	True Brix=3.4	SG=1.013
	Pitched malolactic (Viniflora + ActiML) (see MLF notes above)		
Tues., 8/7 8AM	RBRIX=7	True Brix=-2.3	SG=0.991
	Still somewhat eggy.		
9PM	Pressed wine to three large carboys		
Wed., 8/8 PM	Racked-off the gross lees 6gal/5gal/partial 3gal all under air-lock Very eggy...Treated with 15ml Bocksin per carboy followed By 0.5g/gal Redulees		
Sun., 8/12	Paper chromatography baseline reveals lots of malic acid present		
	Egginess virtually gone but "wet ash tray" on front with strong tobacco on finish is even worse than Batch "L" insofar as no fruit showing through.		
Tues., 8/14	Transferred to 30 gal Flextank with all other batches of St. Croix.		

BATCH "S"

5 gallons/19L (in fermentation bucket); estimated 3 gal (11.3L) of finished wine given 60% press yield
Punched-down 3X daily.

Chapitalization; Oak/Fermaid-K/OptiRed additions all the same as for Batch "L"

D254 yeast (like Batch "R") to add some complexity.

Starting values: RBRIX=21; Temperature=71F

Sat., 8/4 10PM Pitched 8g D254 yeast/20g GO-FERM using standard protocol

Sun., 8/4 Noon First Fermaid-K addition

Added Cabernet Franc skins (left-over from previous fermentation)

Mon., 8/6 11PM

RBRIX=12

Smells/tastes very nice (no sign of egginess or H₂S).

Pitched malolactic bacteria (Viniflora + Acti-ML...See above)

Tues., 8/7 8AM RBRIX=9

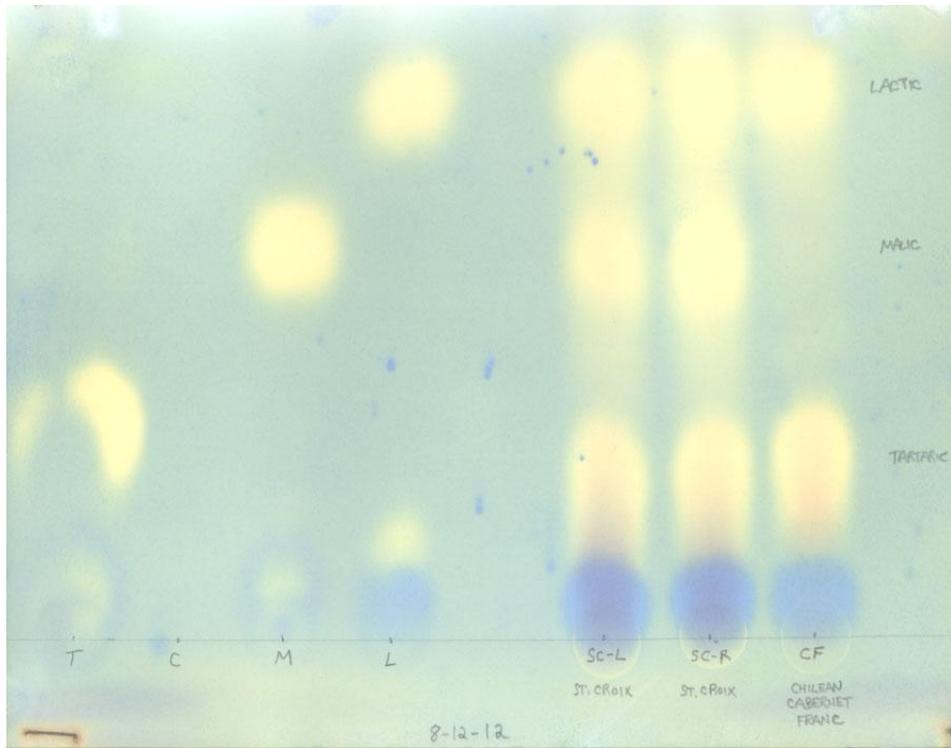
5PM Pressed to 5 gal carboy under air lock despite still actively fermenting
(probably behind other fermenters due to reduced heat buildup)

Thurs., 8/7 Racked-off gross lees (3gal + ½ gal jug)

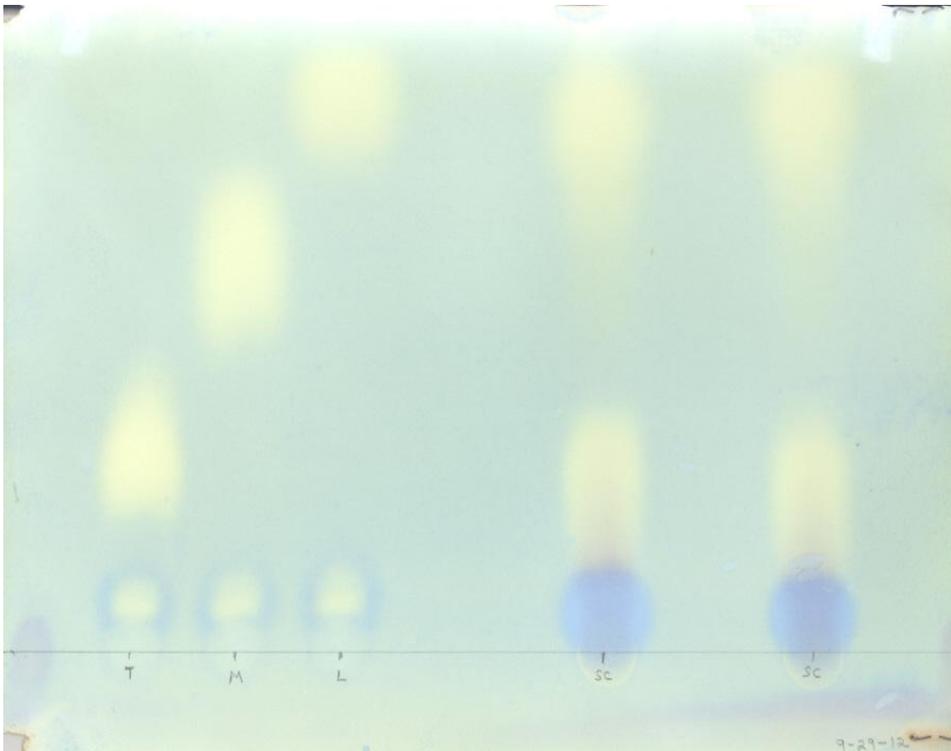
Eggy smell...Treated with 0.5 g/gal Redulees as a precaution.

Sun., 8/12 Baseline paper chromatography shows abundant malic acid present.

Tues., 8/14 All batches of 2012 St. Croix transferred to 30 gal Flextank to finish MLF.
Total yield at this point was **31 gallons** (1 gal extra for topoff)



MLF paper chromatography baselines (8-12-2012) indicate plenty of malic acid present



Paper chromatography performed on 9-29-2012 indicates MLF has neared completion

Flextank Maturation

Tues., 8/14 All 2012 St. Croix added to 30 gallon Flextank micro-ox maturation vessel.
Positive paper chromatography baselines collected on all batches prior to Flextank.

Tasting Notes:

Awful ashtray taste/tobacco finish noted earlier is almost gone!

Typical St. Croix nose/taste has begun to emerge.

Sat., 9/29 Paper chromatography indicates that MLF is near completion.
Wait 4 more weeks to make sure.

Mon., 10/22 MLF complete.
Add **100 PPM SO₂** (19.9g KMETA—first SO₂ addition))
Add **TanCor** maturation tannin (16.5g TanCor)
Based on 145mg/L dose (recommended dose: 100-300 mg/L)

Tasting notes: (Should also have tasted BEFORE SO₂+tannin additions-see below)
Cloudy and somewhat light in color. SO₂ and stirring probably contributed to the cloudiness. Wine still has a slight “ash” flavor but has softened and even developed a bit of a “sweet” taste.

The untreated topoff jug tastes more fruity than the main tank.

Still nervous but becoming cautiously optimistic about this wine’s future.

Sat., 12/15 Sensory evaluation (using Flextank microsampling valve)
Color is deep/nice (unlike previously). Clear structure due to TanCor addition.
“Ash” smell continues to fade; ashtray taste almost gone.
Mouthfeel remains fantastic (for a hybrid grape wine).
Free SO₂ = 51 PPM (ready to be racked to spare Flextank)

Sun., 1/6/13 First racking post-MLF to fresh Flextank
Pushed with argon gas into non-purged Flextank.
Small amount of “sludge” on bottom of tank.
Topped-off with approx.. 1 gal of St. Croix reserve.

Wed., 1/16/13 Sensory evaluation:
“Ash” taste is virtually gone. Wine tasting “dumb” and “flabby” at this point.
pH = 4.05 (yikes! MLF increased pH by 0.2 units)
Free SO₂ = 48 PPM
TA = 5.5 g/L

Due to high pH and “flabby” taste...experimented with adding a few “pinches” of tartaric acid to a 25 ml sample of wine. This really “brightened up” the flavor of the wine (although a bit too tart) and dropped the pH to 3.15. Given these findings, 500 ml of wine was drawn off and bench trials on the effects of tartaric additions upon taste and pH were performed.

Tartaric addition bench trials

Added T (g/L) pH

1.0 3.9

1.5 3.84

2.0 3.78

2.5 3.68 – tastes more refreshing but just a bit tart

Given the flabby taste of the wine plus a possible hint of “funkiness” on the finish (indicative of bacterial activity) together with the very high pH...I decided to add 2.5 g/L tartaric acid to the entire 30 gal of wine. This is the largest acid addition that I have ever made (and violates my 1 g/L “rule of thumb”) but I have decided to “bite-the-bullet” and do it. The slight “over” tartness should be mitigated by some of the tartaric acid eventually falling out of solution.

[Final results indicate that this was the correct decision \(Discuss this with Doug G.\).](#)

Added 2.5 g/L (384g) of tartaric acid and stirred thoroughly.

Sun., 1/20/13 Wine tank smells nicely of dark red fruit.
New pH = 3.7 at 18-deg C (Good enough)
Bumped free SO₂ from 48 to 63 PPM (15 PPM/3g KMETA added)

Sun., 2/17/13 **pH = 3.68** (Holding firmly following tartaric acid addition)
Based upon consultation with Brick Packaging, decided to use French Oak on this wine (Due to its low tannin content). Added 0.03 lbs/gal (14.4 ounces) of **Pronektar French Oak Segments** (medium toast) via a nylon mesh bag that was weighed down with marbles (with a string and cork float for later retrieval)
Leave oak in tank for 2-4 months (depending upon taste).

Just-for-Fun Blending Trials of Unoaked St. Croix

St. Croix + Napa River Ranch Cabernet Sauvignon RESERVE + Chilean Cab Franc

Results:

50ml St Croix + 25ml CF → Best of Cabernet Franc blends

50ml St. Croix + 10ml CS → Best of Cabernet Sauvignon blends

50ml St. Croix + 5ml CF + 5ml CS → Best of all blend trials (Extremely harmonious)

Reserve Cabernet Sauvignon is too good to use as a blender. When St. Croix is finished oaking we'll try again with non-Reserve NRR Cabernet Sauvignon.

St. Croix Tasting Notes:

12 hours after adding oak segments a barrel sample already showing improvement. Very nice color, flavor, aroma, mouthfeel and even some length on the finish. Still has a small “hole” in the middle that should fill-in with some CF plus CS blending.

I AM VERY PLEASED WITH THE WINE AS OF NOW.

Sat., 3/2/13 Sensory evaluation: Oak is already quite pronounced but more headroom remains.
Free SO₂ = 44 PPM

Mon., 3/8/13 **Free SO₂ = 37 PPM** Drop of 8 PPM in just two weeks. Significant air in neck of tank. Topped up and **added 26 PPM (5.2g KMETA) SO₂** to bump up to 63 PPM.

Topoff: 750 ml 2012 St. Croix + 750 ml Koch Cabernet

Sensory evaluation:

It's been one month on the oak segments. A tiny bit of ashtray is apparent on the first sniff and some sort of "dill" thing is going on. However, the midpalate has improved significantly. Good overall mouthfeel. I am still very hopeful (but not quite as much as noted at the preliminary blending trials). [Dill ultimately disappeared.](#)

Sun., 3/30/13 Sensory evaluation: Ashtray not noticed today (Good news!). Still room for additional oaking. Cab F and Cab S blending should help this wine.
pH = 3.72

Fri., 5/24/13 Sensory evaluation:
Starting to taste a bit over oaked (on the finish). It's time to rack, blend and bottle. Just received fresh corks from Brick Packaging so we're ready to go. Middle has filled-in and mouthfeel continues to be very good. Just a touch of tobacco remains (but not outside of range expected for St. Croix). [In retrospect, this wine could have benefited from a bit more oak. Bump-up oak segment dosage by 20% next time.](#)

Final Blends/Bottling

2012 Vermillion St. Croix (10 cases)

85% St. Croix; 8% NRR Cabernet Sauvignon; 7% Chilean Cabernet Franc
pH = 3.75; TA = 6.3 g/L; free SO₂ = 43 PPM; Alcohol (v/v) = 11.8%; RS = 0.2% (Clinitest)

Color: clear garnet

Nose: red berry/cherry; floral spice; bit of forest floor

Flavor: strong black cherry; raspberry

Body: medium-to-full bodied; pleasant mouthfeel

Finish: pleasant tartness; drying on lips/gums; lingering but nice tobacco notes

Overall: Nice everyday drinker, 80/100 points [quite good for a hybrid; mediocre compared to Vinifera]
Probably as good as can be expected w/o extended skin contact & oak barrel concentration
(which is the plan for the 2014 vintage of St. Croix)

2012 Iowa St. Croix (CF) (1.5 cases)

97% St. Croix; 3% Chilean Cabernet Sauvignon

2012 Iowa St. Croix (2 cases)

100% Western Iowa St. Croix

All blending wines were vinified in Vermillion, SD by the winemaker ([Moundtop Microvinification](#))