

Pilot Testing of Raw Elderberry Vinegar Production Feasibility For Small Farms (FNC23-1390)

Tom Ruggieri
Fair Share Farm

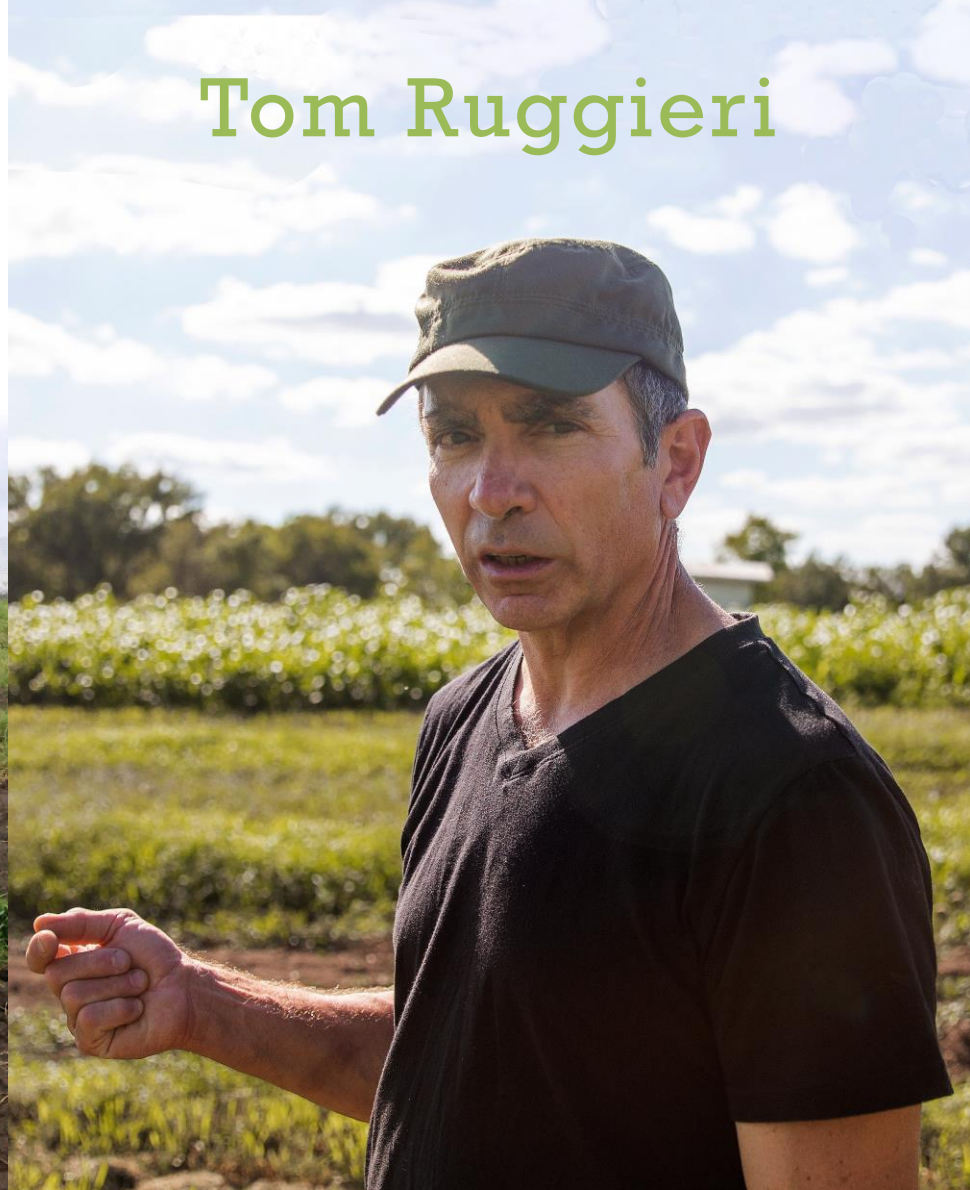


Farmers

Rebecca Graff



Tom Ruggieri



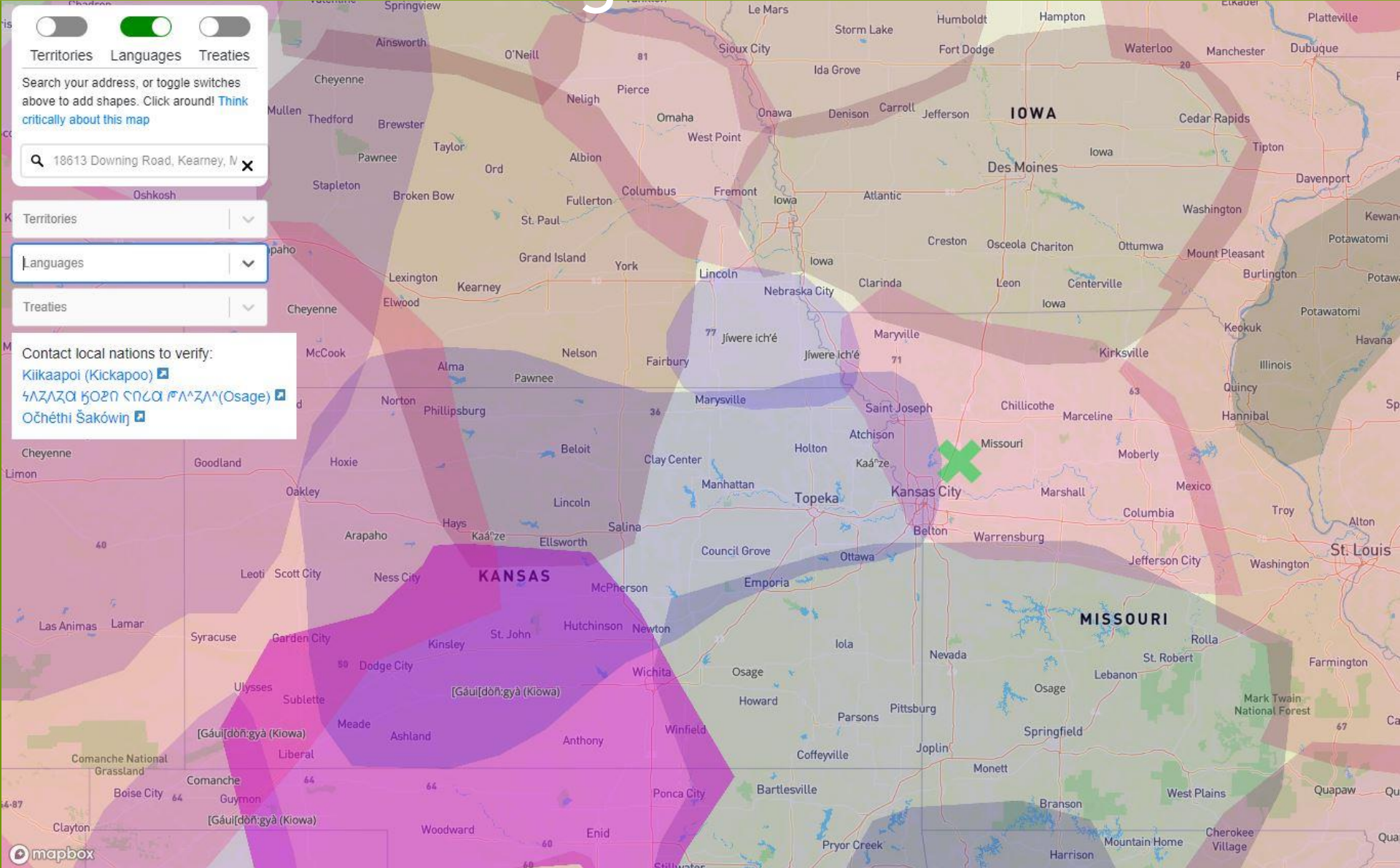
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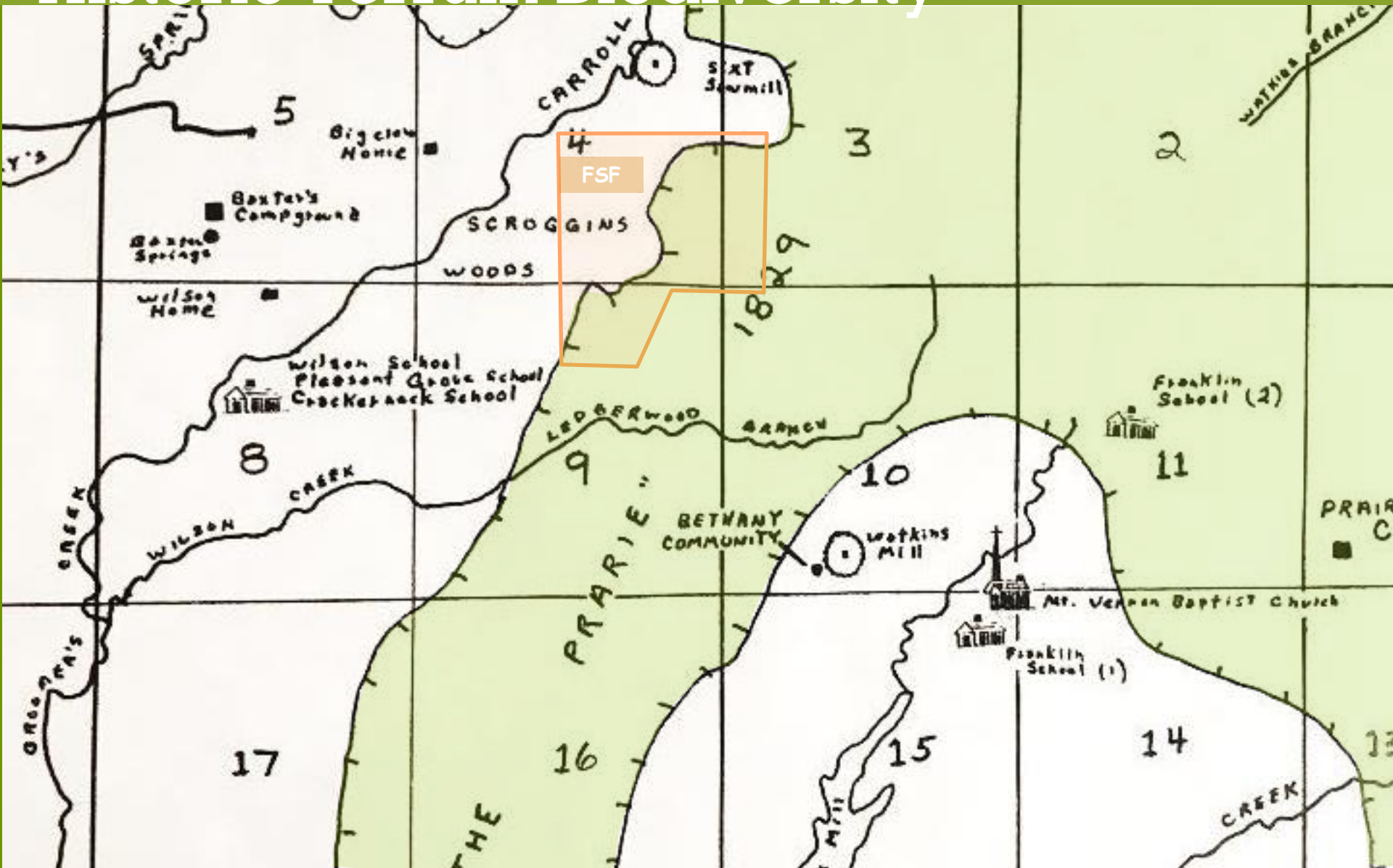
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Land Acknowledgement



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Historic Terrain Biodiversity



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18 Years of Community Supported Ag



Fair Share Farm Ferments



Fair Share Farm

SARE Project Work Plan

- Winery permitting
- Vinegar research and on-line course
- Juicing and winemaking
- Vinegar production evaluation (4 methods)
- Evaluate health chemistry
- Evaluate culinary benefits, public demand
- Evaluate restaurant production of vinegar

MO ATC Bureau Winery Licensing



Missouri Department of Public Safety
Division of Alcohol and Tobacco Control

CHECKLIST OF REQUIREMENTS FOR MANUFACTURER-SOLICITOR LICENSE

PROCEDURE FOR APPLYING FOR A MANUFACTURER LIQUOR LICENSE (pursuant to section 311.180, RSMo.)

ALLOW 10 – 21 DAYS FOR PROCESSING

1. APPLICATION FOR MANUFACTURER-SOLICITOR – Completed application form filled out in black ink or typed, signed by the applicant(s) or managing officer and notarized.
2. LICENSE FEE – **Money Order or Cashier's check** made payable to the Director of Revenue, State of Missouri, for the correct amount of pro-rated license fee.
3. CRIMINAL RECORD CHECK – Submission of a criminal record check issued by the Missouri State Highway Patrol Criminal Records Division (Missouri residents) or the applicable state criminal records division of residency for non-Missourians. Must be dated within six (6) months of the date of application. Must include the individual's full name, any commonly used aliases, date of birth, and social security number. Record checks are required for the 1) sole owner, all partners, or the managing officer, 2) each officer/director for the applicant entity, and 3) each stock/share holder, trustee, or person owning or controlling, legally or beneficially, directly or indirectly, ten percent or more overall of the applicant entity. Missouri record checks can be obtained [online](#) or by mail using this [link](#) to access the Criminal Record Check Form.
4. MISSOURI RETAIL SALES TAX LICENSE – Copy of Missouri Retail Sales Tax license in the name of the applicant, partners, or Corporation or Organization with the correct address of the business to be licensed (only necessary if the Manufacturer plans to sell merchandise/items to consumers).
5. CERTIFICATE OF NO TAX DUE – From the Missouri Department of Revenue; must be dated within 90 days and addressed "To Supervisor of Liquor Control." **Required regardless of exemption status.** Can be obtained [online](#) with the Tax ID and PIN, or by phone at (573) 751-9268.
6. TAX RECEIPT – Copy of the paid personal property tax or real estate tax receipt for the preceding year of the sole owner (sole proprietor), all partners (partnership), or the managing officer (LLC or corporations). A waiver of non-assessment will be accepted in lieu of the paid receipt if taxes were not owed the preceding year.



Missouri Department of Public Safety
Division of Alcohol and Tobacco Control

CHECKLIST OF REQUIREMENTS FOR MANUFACTURER-SOLICITOR LICENSE

7. VOTER REGISTRATION – Proof of voter registration (ex. copy of voter registration card, letter, etc.) or printout from the Missouri Secretary of State's [voter verification website](#) of the sole owner (sole proprietor), all partners (partnership), or the managing officer (LLC or corporations).
8. PHOTO(S) – Gray-scale or black and white computer printouts are acceptable so long as features are clear.
 - a. Recent photograph of the sole owner, each partner, or the managing officer (depending on the business structure) without a hat or sunglasses.
 - b. Recent photograph of the front of the building to be licensed and any detached storage areas.
9. COPY OF SIGNED LEASE, DEED OR RENTAL AGREEMENT – Copy of lease, rental agreement or contract of sale, or copy of warranty deed for premises to be licensed (must be in the name of person, persons or entity applying for the license).
10. CERTIFICATE OF GOOD STANDING – From the Secretary of State or applicable state authority, dated within 90 days for the applicant organization. Not applicable to sole proprietors or general partnerships. Entities applying within 90 days of forming the entity may submit the Articles of Organization certificate in lieu of a Certificate of Good Standing. Required for the applicant entity and all legal entities owning or controlling ten percent or more of the stock or interest in the business.
11. COPY OF FEDERAL PERMIT – From TTB (Alcohol Tax & Trade Bureau).
12. TAX BOND – A Corporate Bond [form](#) properly executed by a bonding company and signed by the sole owner, all partners, or managing officer; or, an Assignment of Certificate of Deposit [form](#) properly executed by your banking institution and with the notarized signatures of the sole owner, all partners, or managing officer. The initial amount shall be \$1,000.00.
13. HEALTH INSPECTION – Copy of a completed state health inspection if the applicant will also be wholesaling product. If not wholesaling, a health inspection may be obtained from the local public health agency.
14. SITE VISIT – Contact the local district (see the district service areas under the "Return Documents To" section) to set up a pre-licensure site visit.

US Treasury Tax and Trade Bureau Permit



TTB Alcohol and Tobacco
Tax and Trade Bureau
U.S. Department of the Treasury

Permits Online

[Announcements](#) | [Logged in as: Thomas Ruggieri](#) | [My Record Collections \(0\)](#) | [Cart \(0\)](#) | [Reports \(16\)](#) ▼ | [Account Management](#) | [Log out](#)

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[Create a New Application](#) | [Search Your Applications](#)

New Applications Wizard

2 Review

3 Application
package

4 Submission
confirmation

Step 1 : Determine applications >>

This wizard will help you identify, fill out, and submit a package of the applications you'll need in order to get your TTB permits, registrations, and/or notices.

* indicates a required field

Application Contact

Please review the contact information we have on file for you. This should be your information, as the person filling out this application package, even if you're doing it on behalf of someone else.



Thomas Ruggieri
18613 Downing Rd
tom@fairsharefarm.com
816-320-3763

18613 Downing Rd
Kearney, MO, 64060

[Edit](#)

TTB Permit and MO ATC License

2023-WINE-00659-0

DEPARTMENT OF THE TREASURY - ALCOHOL AND TOBACCO TAX AND TRADE BUREAU	
BASIC PERMIT (Under Federal Alcohol Administration Act)	1. PERMIT NUMBER MO-W-21208
	2. DATE OF PERMIT 07/18/2023
5. NAME AND ADDRESS OF PERMITTEE (Number and street, city or town, State and Zip Code) FAIR SHARE FARM LLC DBA:FAIR SHARE FARM 18613 DOWNING RD KEARNEY, MO 64060	3. REGISTRY NUMBER (if applicable) BWN-MO-21195
	4. DATE OF APPLICATION 06/15/2023
6. TRADE NAMES AUTHORIZED BY THIS PERMIT (Trade name approval does not constitute approval as a brand name for labeling purposes. If needed, list on reverse or use continuation sheet)	
7. PERMIT GRANTED FOR (ONE TYPE OF OPERATION ONLY)	
Pursuant to the application of the date indicated in item 4, you are authorized and permitted to engage, at the above address, in the business of:	
a. <input type="checkbox"/> Distilled Spirits - <input type="checkbox"/> distiller <input type="checkbox"/> rectifier (processor) <input type="checkbox"/> warehouseman and/or <input type="checkbox"/> warehouseman and bottler while so engaged, to sell, offer or deliver for sale, contract to sell or ship, in interstate or foreign commerce, the distilled spirits so distilled or rectified, or warehoused and bottled, or the wines so rectified.	
b. <input checked="" type="checkbox"/> Wine - <input checked="" type="checkbox"/> producer and blender <input type="checkbox"/> blender and while so engaged, to sell, offer or deliver for sale, contract to sell or ship, in interstate or foreign commerce, the wine so produced or blended.	
c. <input type="checkbox"/> Importer - Importing into the United States the following alcoholic beverages: while so engaged, to sell, offer to deliver for sale, contract to sell or ship, in interstate or foreign commerce, the alcoholic beverages so imported.	
d. <input type="checkbox"/> Wholesaler - Purchasing for resale at wholesale the following alcoholic beverages: while so engaged, to receive or to sell, offer or deliver for sale, contract to sell or ship, in interstate or foreign commerce, the alcoholic beverages so purchased.	
This Permit is conditioned upon your compliance with the Federal Alcohol Administration Act, the Twenty-first Amendment and laws relating to its enforcement; all other Federal laws relating to distilled spirits, wine, and malt beverages, including taxes with respect to them; the Federal Water Pollution Control Act; and, all applicable regulations made pursuant to law which are now, or may hereafter be, in force.	
This basic permit is effective from the date shown above and will remain in force until suspended, revoked, annulled, voluntarily surrendered, or automatically terminated.	
THIS PERMIT WILL AUTOMATICALLY TERMINATE THIRTY DAYS AFTER ANY CHANGE IN PROPRIETORSHIP OR CONTROL OF THE BUSINESS, unless an application for a new basic permit is made by the transferee or permittee within the thirty day period. If an application for a new basic permit is timely filed, the outstanding basic permit will continue in effect until the application is acted on by the District Director, Alcohol and Tobacco Tax and Trade Bureau.	
THIS PERMIT IS NOT TRANSFERABLE. ANY CHANGE IN THE TRADE NAME, CORPORATE NAME, MANAGEMENT OR ADDRESS OF THE BUSINESS COVERED BY THIS PERMIT, OR ANY CHANGE IN STOCK OWNERSHIP (MORE THAN 10%) MUST BE REPORTED TO THE NATIONAL REVENUE CENTER OR PUERTO RICO FIELD OFFICE WITHOUT DELAY.	
THIS IS AN <input checked="" type="checkbox"/> ORIGINAL PERMIT	<input type="checkbox"/> AMENDED PERMIT
REASON FOR AMENDMENT	DATE OF AMENDMENT
SIGNATURE AND TITLE OF AUTHORIZED TTB OFFICIAL  Specialist	

TTB F 5170.2 (1/2005)

MISSOURI - DIVISION OF ALCOHOL AND TOBACCO CONTROL - LICENSE

THIS LICENSE MUST BE POSTED ON THE PREMISES IN FULL PUBLIC VIEW

22% MANUFACTURER SOLICITOR

296025

\$200.00

EXPIRATION DATE: JUNE 30, 2025

EFFECTIVE DATE: JULY 1, 2024

CLAY

BUS. STRUCTURE: LMTD LIABILITY

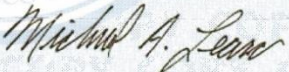
MANAGING OFFICER OR PARTNERS: THOMAS J RUGGIERI

SPECIAL PERMITS:

ALL OF A BUILDING, 18613 DOWNING ROAD, KEARNEY, MO.

RENEWAL NOTICES are mailed annually in March. It's the licensee's responsibility to pay the required fee by MAY 1ST of each calendar year. Late fees will be assessed for late renewal after MAY 1ST.


DIRECTOR OF PUBLIC SAFETY


SUPERVISOR OF ALCOHOL AND TOBACCO CONTROL

FAIR SHARE FARM LLC
FAIR SHARE FARM
18613 DOWNING ROAD
KEARNEY, MO 64060

LICENSE NOT TRANSFERABLE

Fair Share Farm

Malle-Schmickl Vinegar Course

ONLINE-SCHOOL SHOP BOOKS



COURSES

FORUMS

FREE TOOLS

Making Vinegar Courses



In the **vinegar classes** you learn thoroughly during the theoretical part the basics and practical issues of alcohol- and vinegar fermentation, which problems can occur and how to solve them, how to construct a vinegar fermenter, the surface process and generator process, additional flavours by packing the fermenter, storage, as well as breeding a vinegar mother. We have produced about **50 different kinds of vinegar**, a special selection of these you can degust at the theoretical day. In the practical part of the course you **make a vinegar mother by yourself** which you can take home. You work with the **surface process**, start and finish a **vinegar fermenter** (generator process), **analyze acetic acid content** and **alcohol content**. Further you can choose to take away three different vinegars from our sortiment. You have no time or possibility to attend our hands-on workshops? We host also **online courses** on fermenting vinegar. Further we offer **short films**, covering special themes in preparing vinegar.

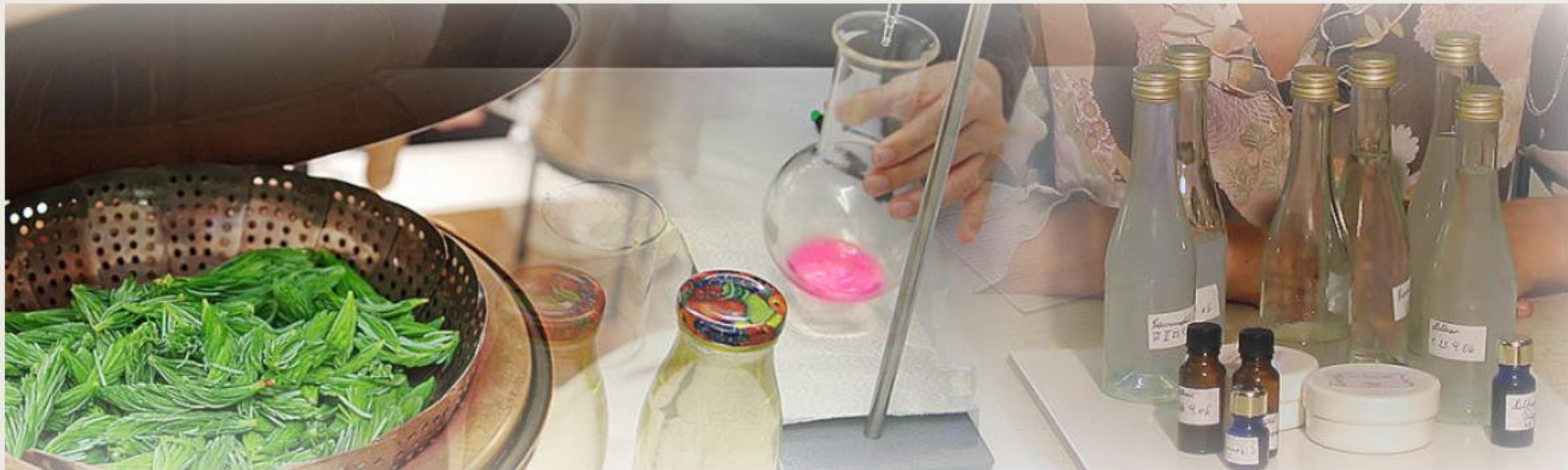


WORKSHOP – CONTENT

WORKSHOP – ENROLL

ONLINE COURSE

Current developments and new features you can find in our **free Newsletter**.



Fair Share Farm

Laboratory Analyses Equipment



Juicing



Winemaking



Fair Share Farm

Wine from Pomace

EW311

Start: 208 lb pomace @ 9 °Brix +/-

13 gallon (108 lb) @ 12 °Brix solution

3.1 lbs raw organic sugar

Proofed EC-1118 yeast (*saccharomyces bayanus*)

Ferment to 0 °Brix

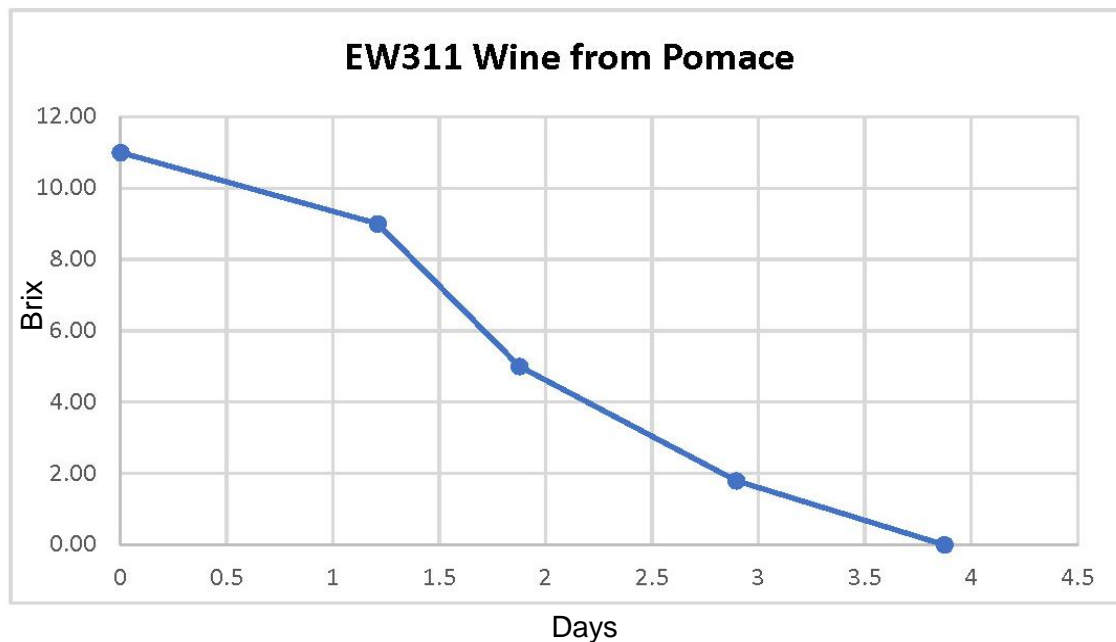
Remove 114 lb pomace at end of fermentation

Store wine in glass @ 55 °F

Days	°Brix	Temp °F
0	11.00	72
1.21	9.00	74
1.88	5.00	75
2.90	1.80	76
3.88	0.00	70

26 gal wine

4 days



Method 1: Malle-Schmickl Vinegar Generator



Generator with Heat Mat and Blanket



Fair Share Farm

Generator Sample Batch

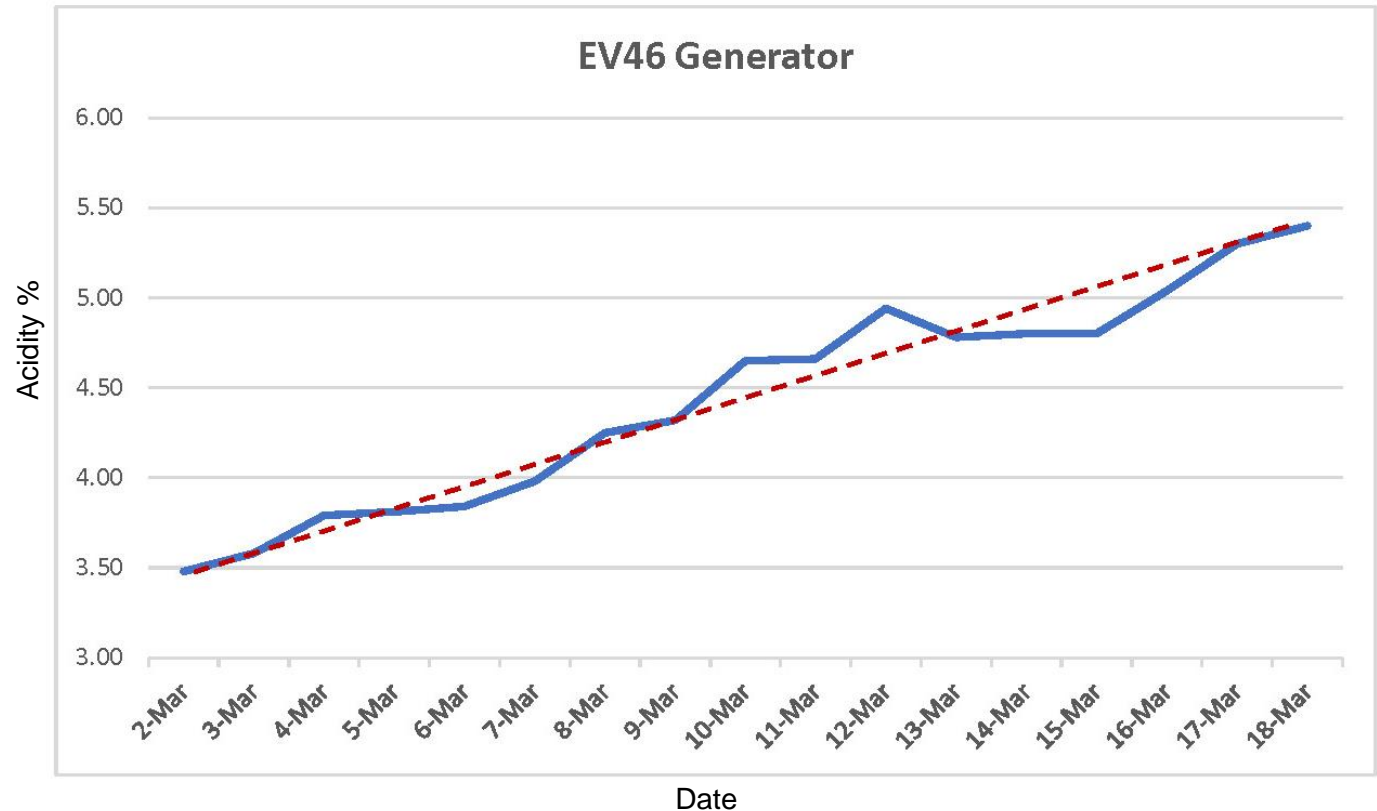
EV46

Date	Acidity (%)
2-Mar	3.48
3-Mar	3.58
4-Mar	3.79
5-Mar	3.81
6-Mar	3.84
7-Mar	3.98
8-Mar	4.25
9-Mar	4.32
10-Mar	4.65
11-Mar	4.66
12-Mar	4.94
13-Mar	4.78
14-Mar	4.80
15-Mar	4.80
16-Mar	5.04
17-Mar	5.30
18-Mar	5.40

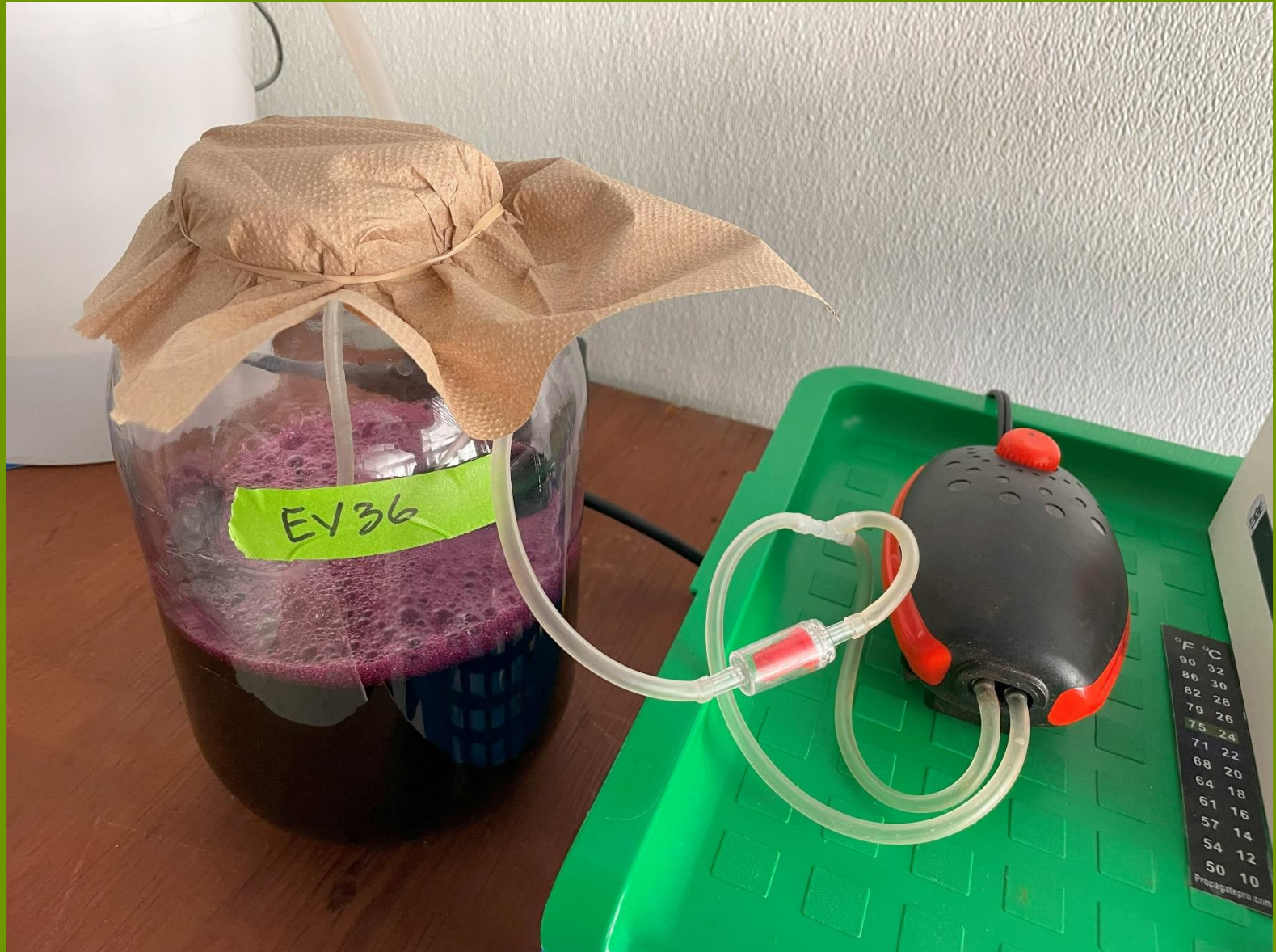
slope = 12.0%

4 gal

16 Days



Method 2: Aerator



Aerator Batch

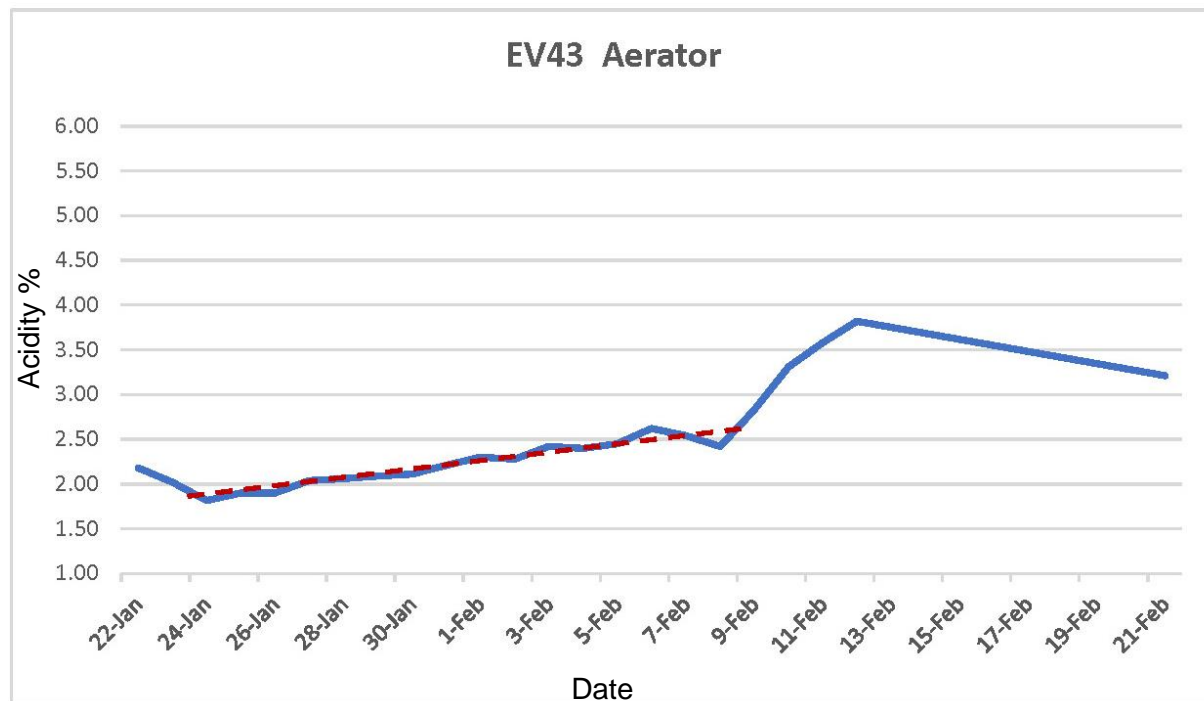
EV43

Date	Acidity (%)	Alcohol % ABV
22-Jan	2.18	4.48
23-Jan	2.02	-
24-Jan	1.82	3.7
25-Jan	1.90	-
26-Jan	1.90	-
27-Jan	2.04	3.7
28-Jan	2.06	-
29-Jan	2.09	-
30-Jan	2.11	-
31-Jan	2.21	-
1-Feb	2.30	3.3
2-Feb	2.28	-
3-Feb	2.42	-
4-Feb	2.40	-
5-Feb	2.45	-
6-Feb	2.62	-
7-Feb	2.54	2.54
8-Feb	2.42	-
9-Feb	2.83	-
10-Feb	3.31	-
11-Feb	3.58	-
12-Feb	3.82	0.35
21-Feb	3.21	-

slope = -2.3%

108 oz

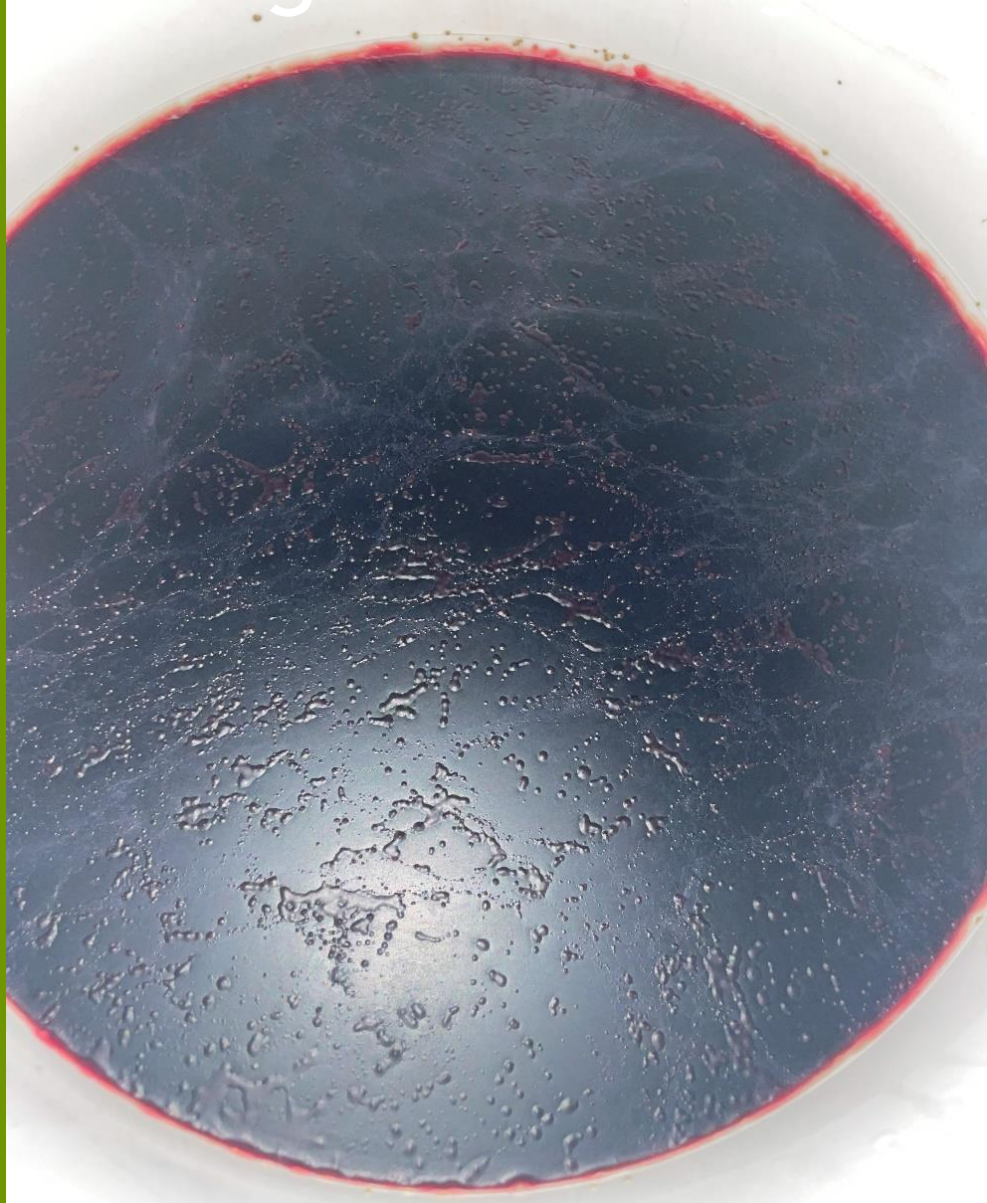
21 days



Method 3: Orleans Bucket



Mother of Vinegar Forming



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Orleans Bucket Sample Batch

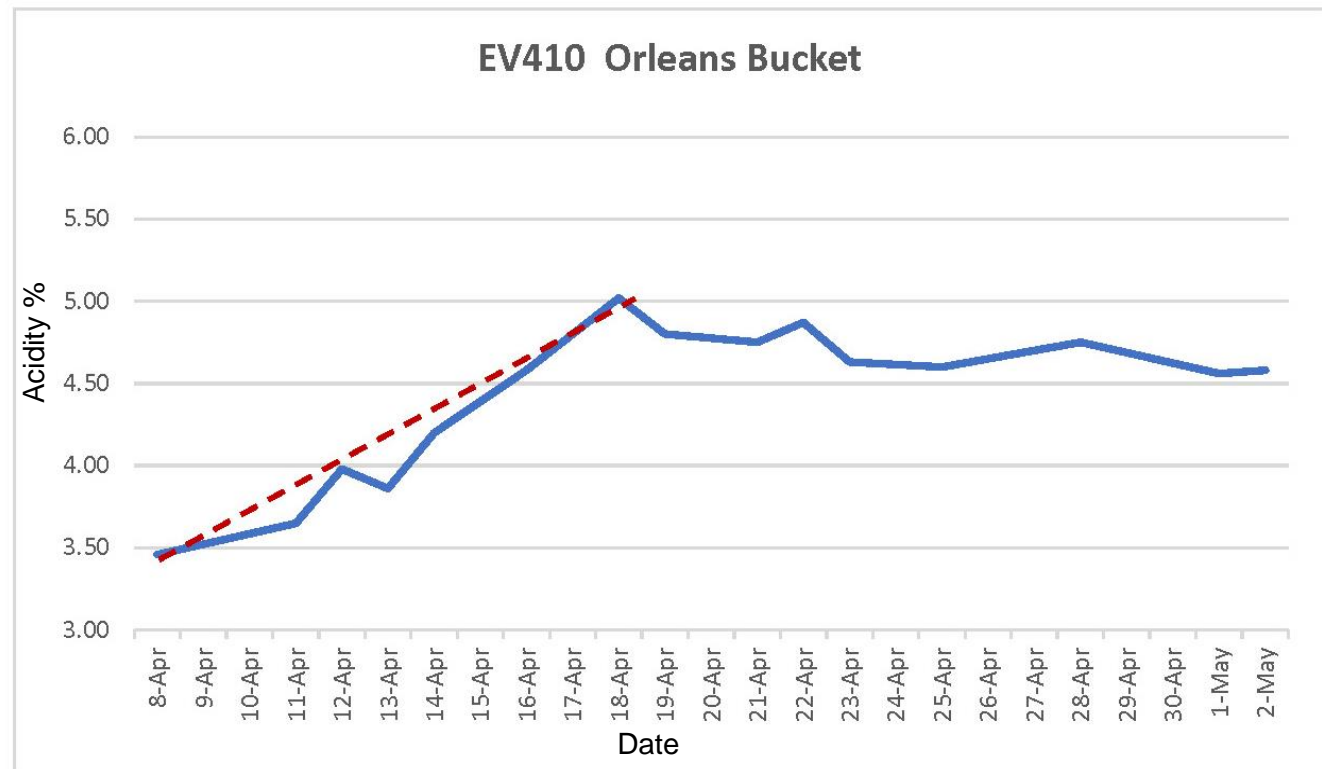
EV410

Date	Acidity (%)
8-Apr	3.46
11-Apr	3.65
12-Apr	3.98
13-Apr	3.86
14-Apr	4.20
15-Apr	4.39
16-Apr	4.58
18-Apr	5.02
19-Apr	4.80
21-Apr	4.75
22-Apr	4.87
23-Apr	4.63
25-Apr	4.60
27-Apr	4.70
28-Apr	4.75
1-May	4.56
2-May	4.58

slope = -12.2%

2 gal

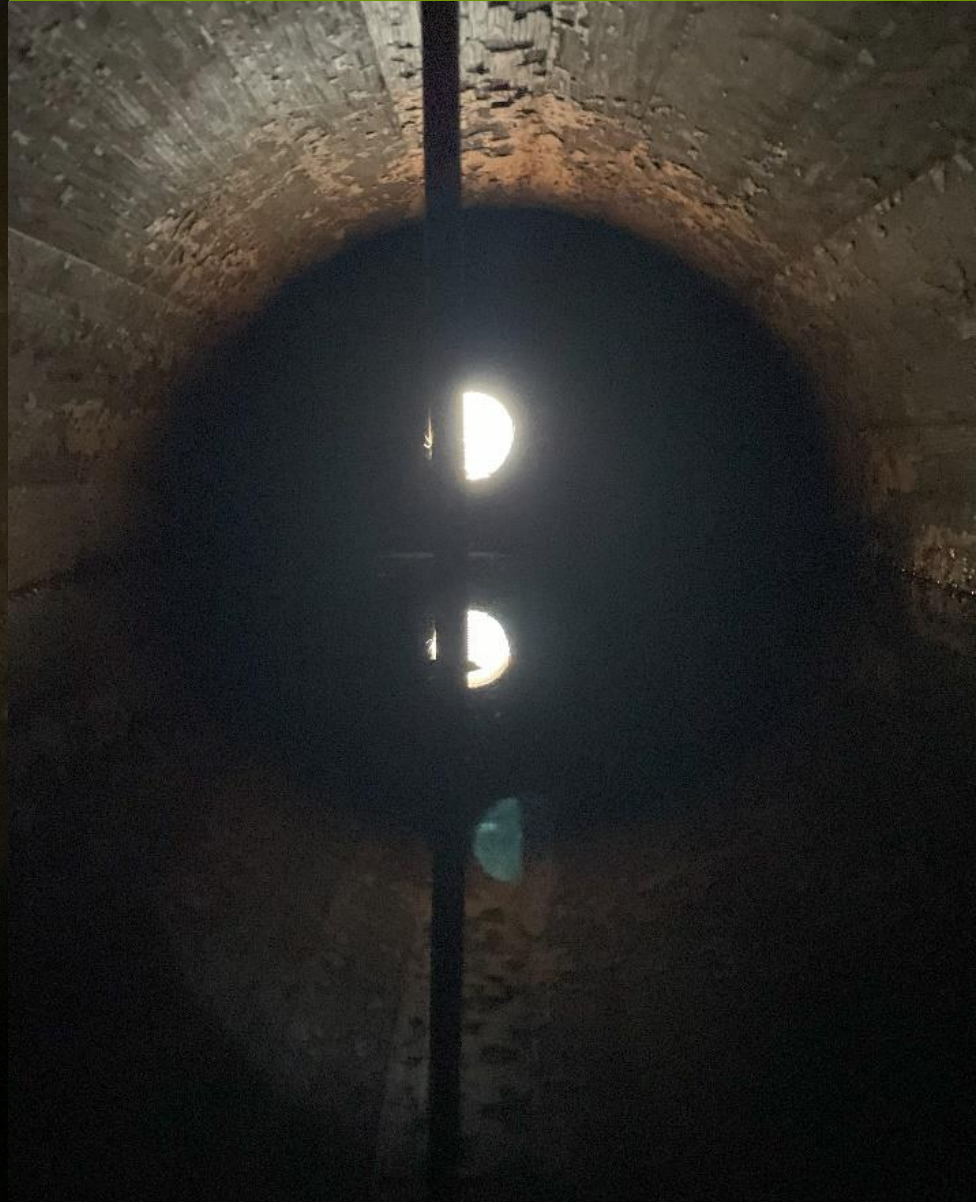
11 days



Method 4: Orleans Barrel



Orleans Barrel Interior



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Orleans Barrel Mother Formation



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Orleans Barrel Sample Batch

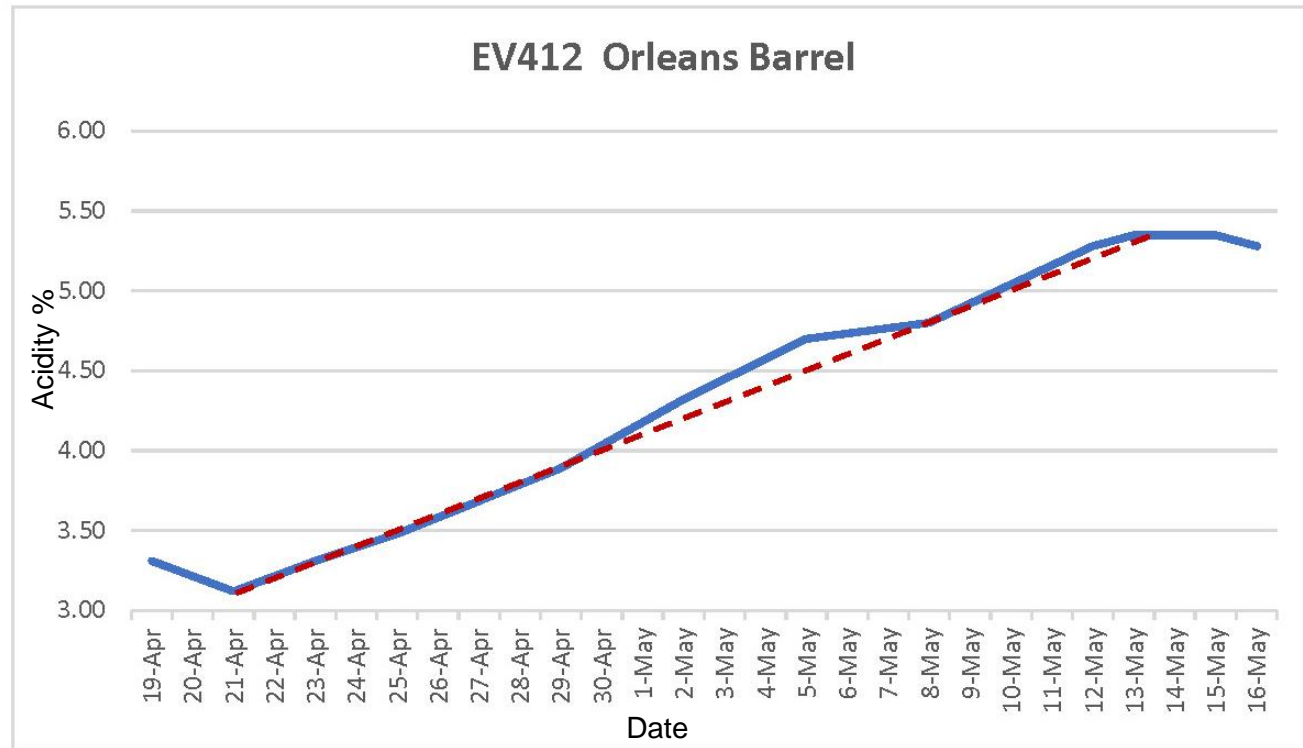
EV412

Date	Acidity (%)
19-Apr	3.31
21-Apr	3.12
23-Apr	3.31
25-Apr	3.48
29-Apr	3.89
2-May	4.32
5-May	4.70
8-May	4.80
12-May	5.28
13-May	5.35
15-May	5.35
16-May	5.28

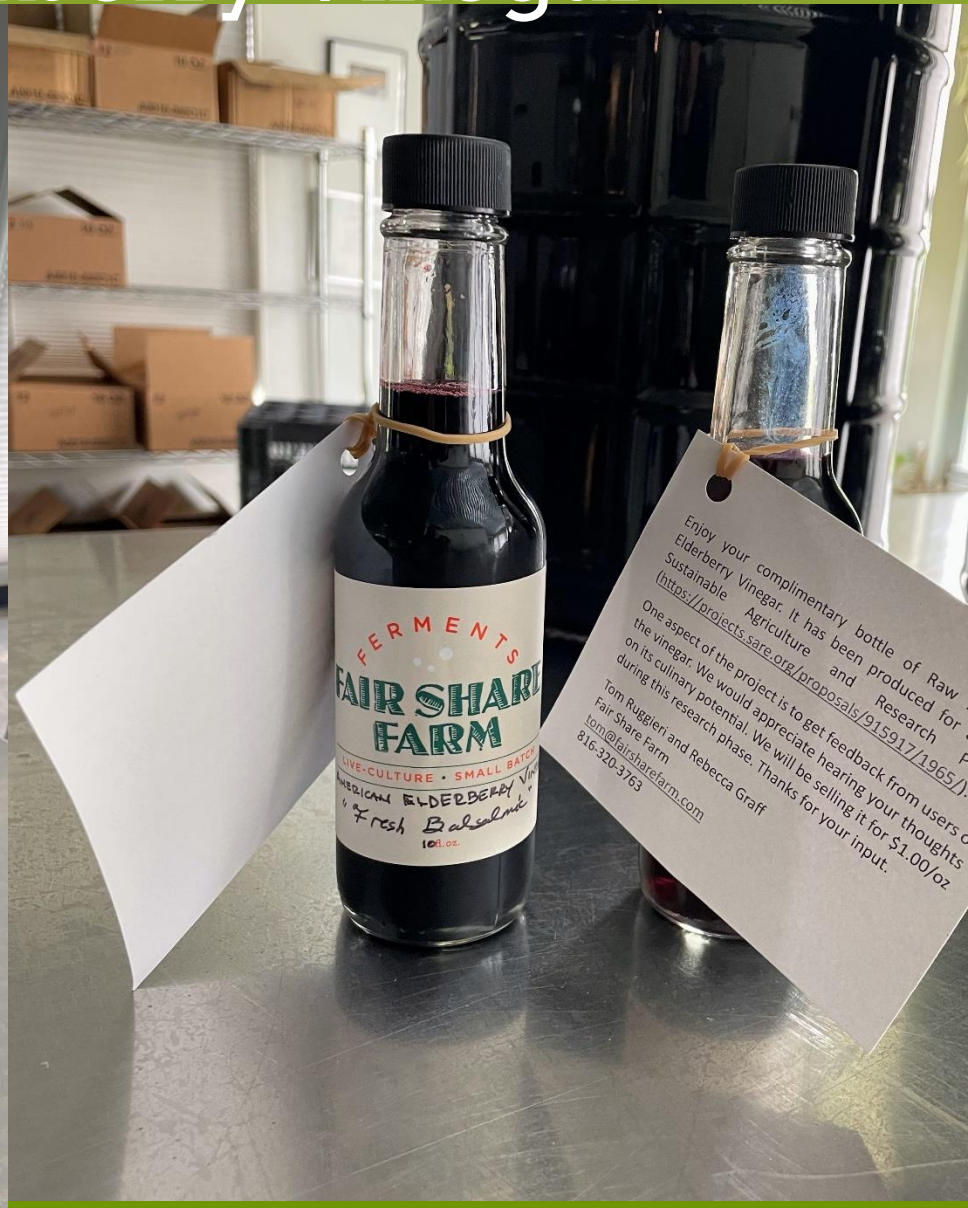
slope = 9.3%

15 gal

24 days

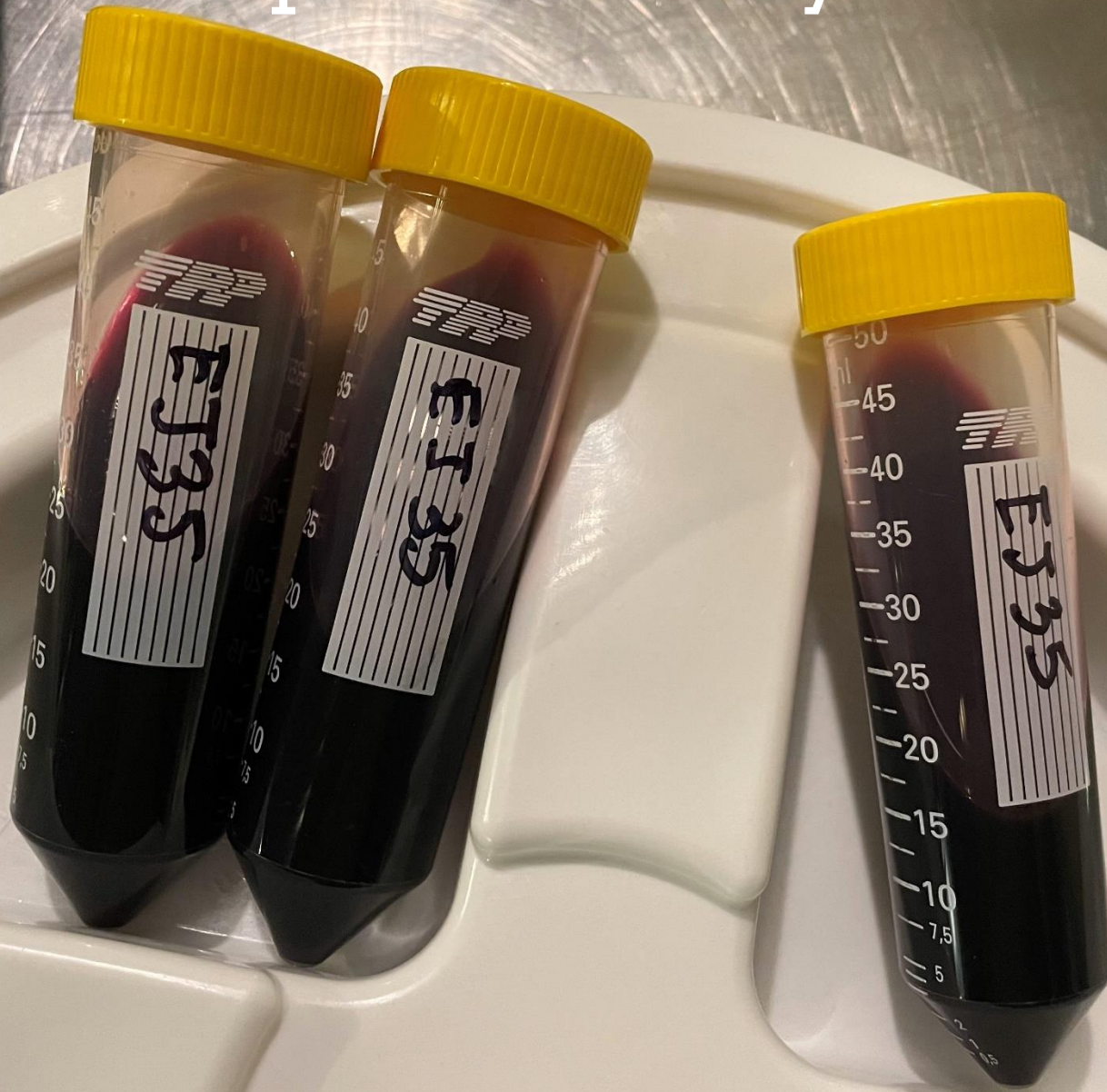


Raw American Elderberry Vinegar

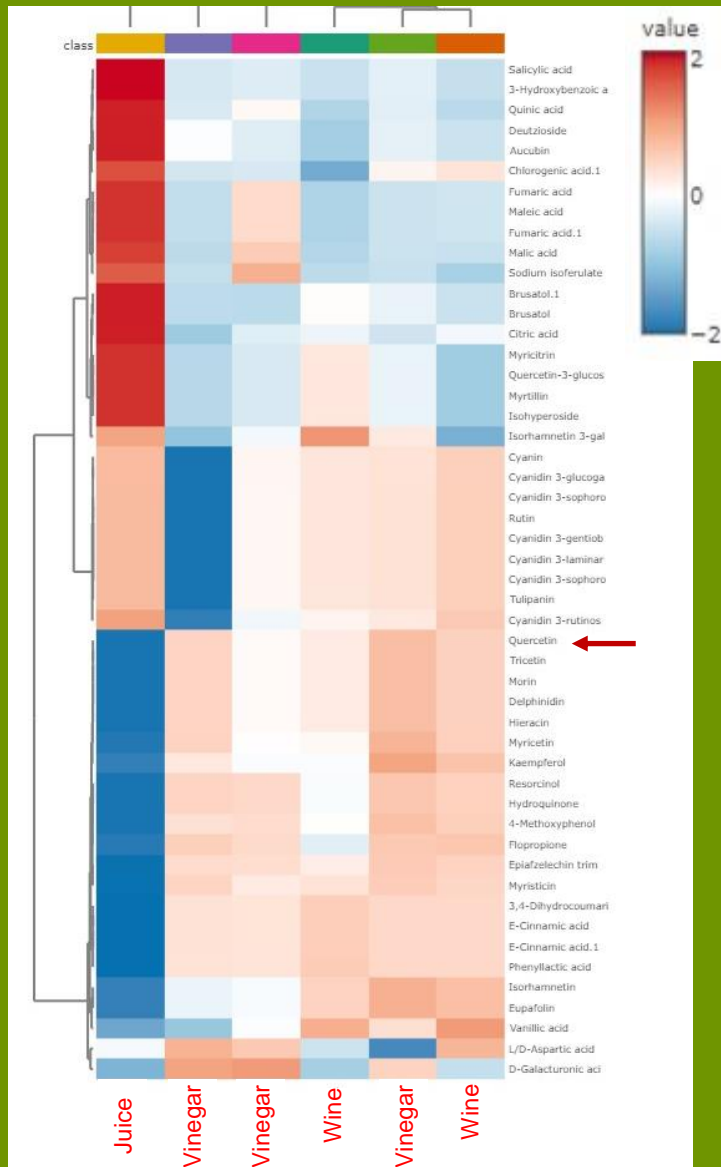


Fair Share Farm

Health Components Analyses



Healthful Components Analysis



PROCESSING STEP	Quercetin
JUICE	
EJ35_1 JUICE	230,694.25
EJ35_2	236,675.47
EJ35_3	209,618.72
WINE	
EW310_1 WINE FROM JUICE	2,183,315.35
EW310_2	2,157,352.30
EW310_3	2,147,644.16
EW311_1 WINE FROM POMACE	
EW311_2	1,701,264.60
EW311_3	1,608,674.06
	1,663,203.84
VINEGAR	
EV46_1 GENERATOR	2,112,797.40
EV46_2	2,029,917.90
EV46_3	2,078,783.73
EV410_1 ORLEANS BUCKET	
EV410_2	2,625,870.33
EV410_3	2,687,173.96
	2,569,687.13
EV412_1 ORLEANS BARREL	
EV412_2	1,464,795.59
EV412_3	1,416,714.28
	1,426,389.85

Healthful Components Analysis Conclusion

The analysis of the elderberry products highlights the unique chemical profiles of the health-promoting compounds in elderberry vinegar and wine compared to juice. ***The higher concentrations of specific compounds in vinegar suggest that it may offer benefits different from those of juice and wine.*** The PCA and heatmap analyses confirm the significant impact of fermentation on the metabolic profiles, further supporting the potential of elderberry vinegar and wine as multifunctional ingredients in various industries.

Public Demand Evaluation---Survey

1. Which sample do you have?

- ☐ X
- ☐ O
- ☐ --

2. Rate on a scale of 1-100, where 1 means you did not enjoy and 100 means you very much enjoyed.

	1	10	20	30	40	50	60	70	80	90	100
Smell	-----										
Taste	-----										
Finish	-----										

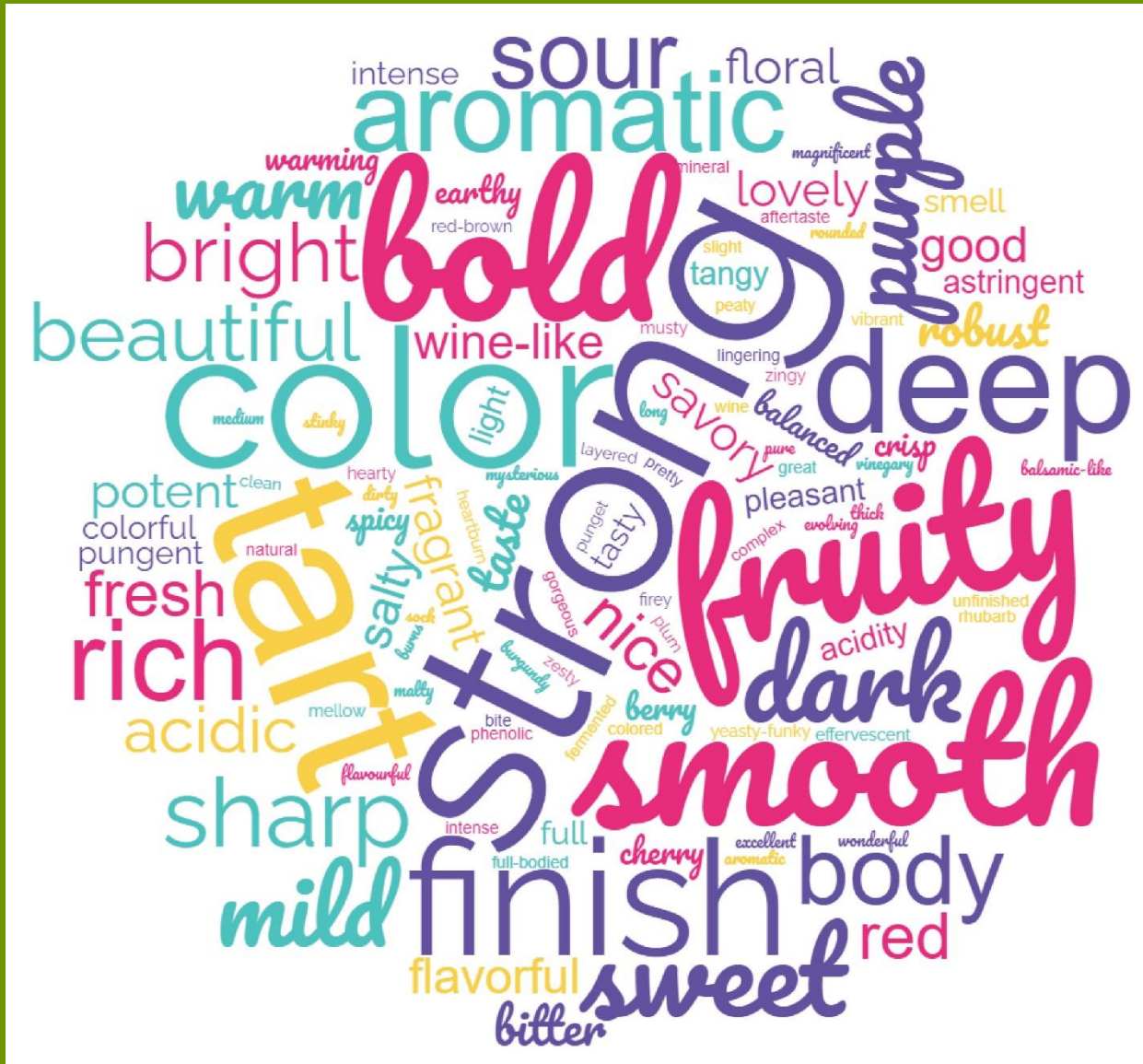
3. Give one to three words to describe the Raw Elderberry Vinegar's characteristics. (such as color, body, aroma, taste, finish)

4. Rate how often you use the following types of products.

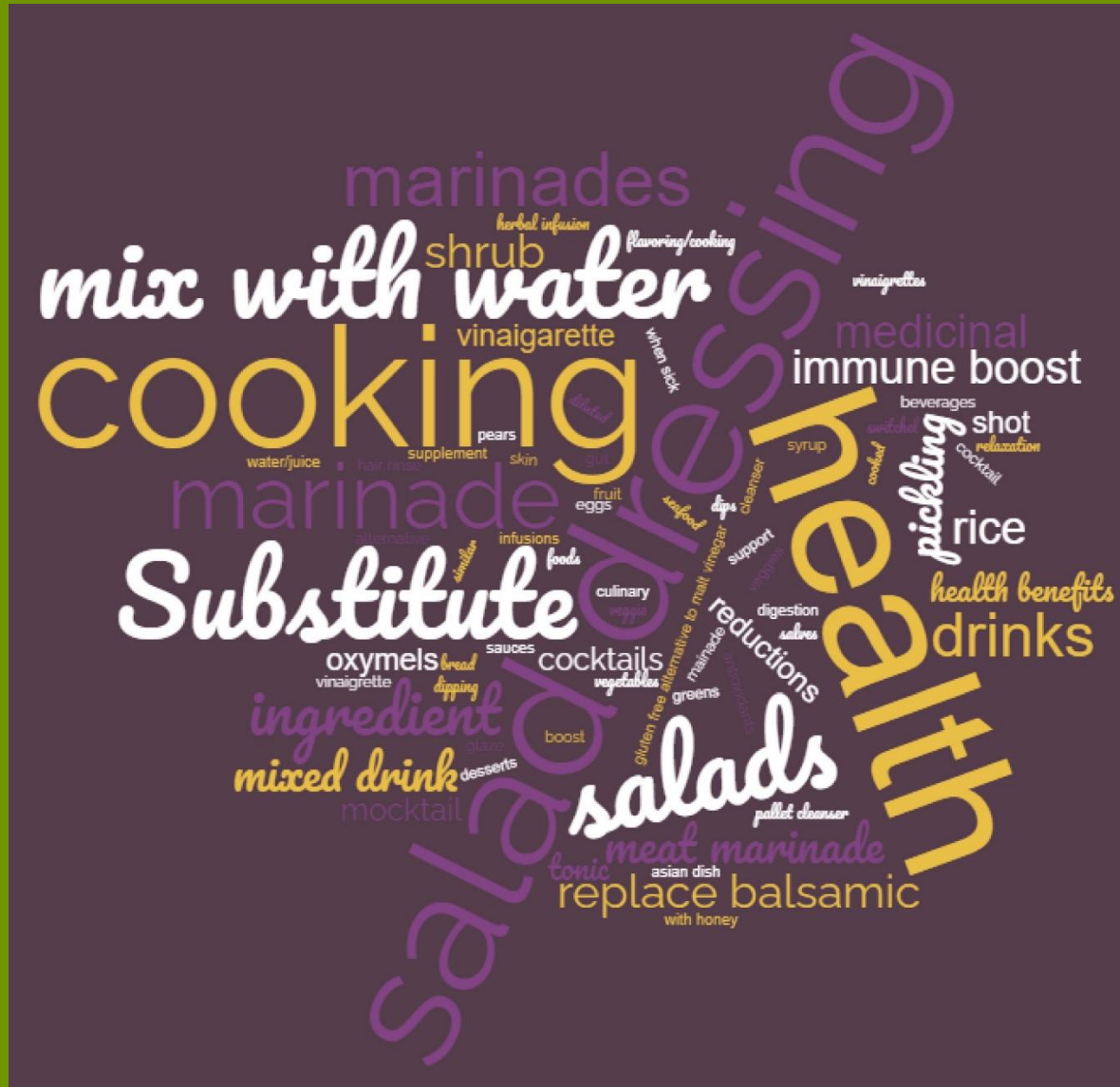
	Never	Annually	Monthly	Weekly	>1x /week
Other elderberry products					
Raw elderberry vinegar					
Other types of vinegars					

5. What do you see as some potential uses for Raw Elderberry Vinegar?

Public Demand Evaluation---Sensory



Public Demand Evaluation---Uses



Conclusions

- Further product development could create a product that serves as a ***comparable substitute***, providing the same usability with additional value-added qualities to command a higher price point.
- Production methods could be adjusted to ***enhance sensory attributes*** described favorably (such as color, and aromas).
- Marketing messages can highlight unique selling points such as ***health benefits*** and unique flavor profiles, perhaps including recipes for suggested health tonics.
- The ***target audience*** should include local sourcing, health-conscious consumers and gourmet cooking enthusiasts.
- There could be ***potential partnerships*** with local chefs and health focused-local-sourcing grocery stores.
- Further research could involve ***follow-up studies*** to test refined product variations and conducted in targeted market venues for deeper insights.

Pear Tart with Elderberry Gastric



**GREEN
DIRT** *on* **OAK**

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Restaurant Production Potential Potential



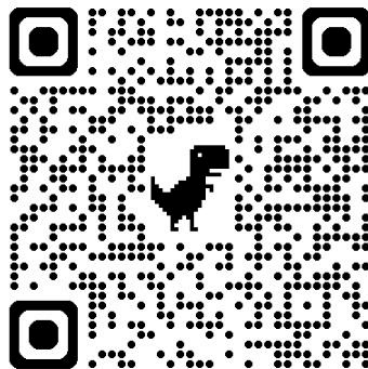
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Restaurant Production Potential

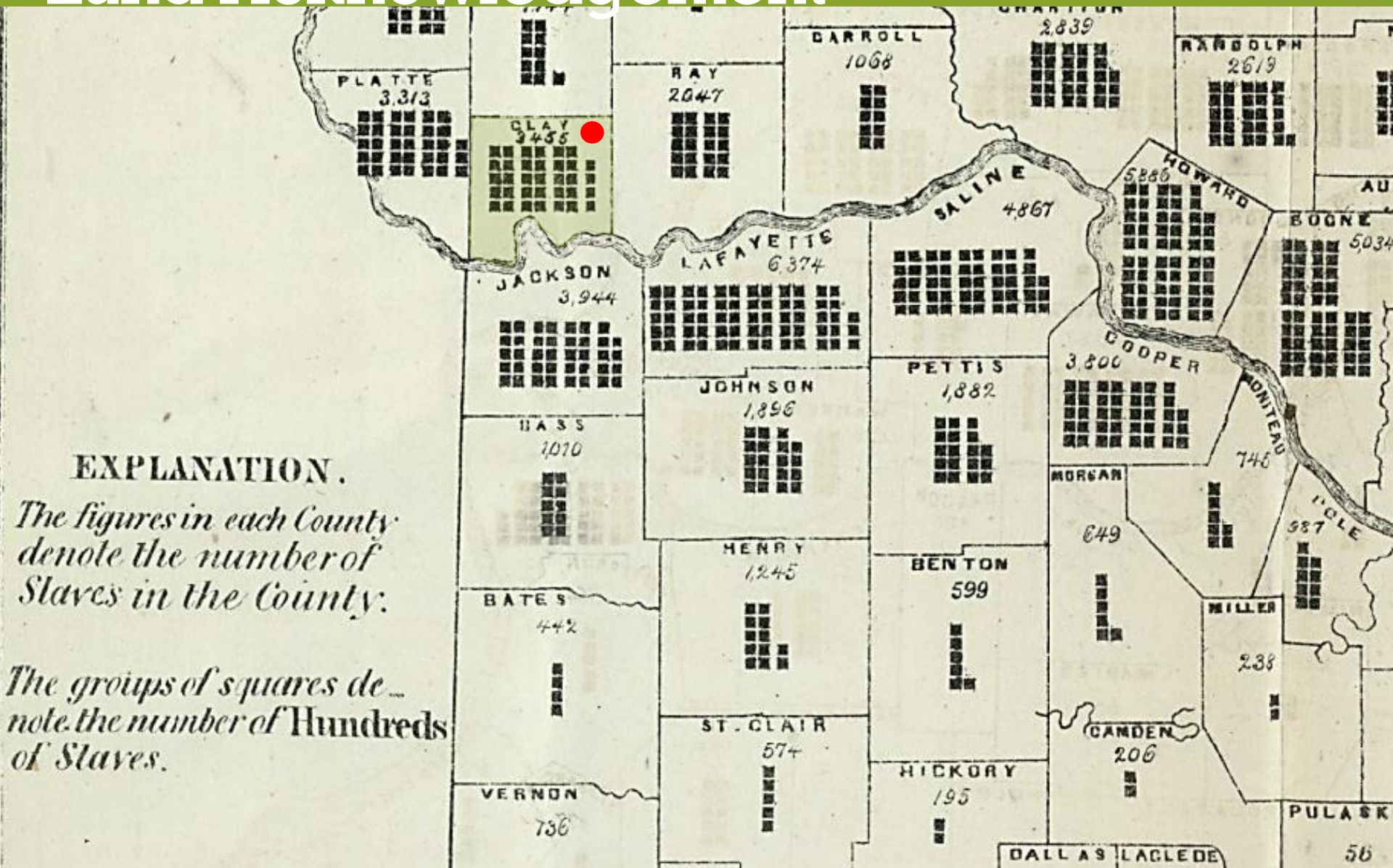
- Logistics and cost precluded the licensing of a restaurant as a winery for this project.
- Production of elderberry vinegar in a restaurant setting requires a serious commitment by the owner and staff. Production of a quality product requires regular testing and monitoring, as well as the appropriate space for fermenting the wine and vinegar.
- When I first met Chef Kendall he presented to me his musings on the idea of a fermentation lounge. If such a lounge were to exist, then perhaps the attention required to make raw vinegar would be possible on a restaurant scale

SARE Final Report

Read how we developed
Raw American Elderberry
Vinegar



Land Acknowledgement



Importance of Testing

A PRACTICAL TREATISE
ON
THE MANUFACTURE OF VINEGAR,
WITH
SPECIAL CONSIDERATION OF WOOD VINEGAR AND OTHER BY-
PRODUCTS OBTAINED IN THE DESTRUCTIVE DISTILLATION
OF WOOD; THE FABRICATION OF ACETATES,
CIDER, AND FRUIT-WINES;
PRESERVATION OF FRUITS AND VEGETABLES BY
CANNING AND EVAPORATION;
PREPARATION OF FRUIT-BUTTERS, JELLIES, MARMALADES,
PICKLES, MUSTARDS, ETC.
PRESERVATION OF MEAT, FISH AND EGGS.
EDITED FROM VARIOUS SOURCES,
BY
WILLIAM T. BRANNT,
AUTHOR OF "A PRACTICAL TREATISE ON THE RAW MATERIALS AND THE DISTILLATION AND
RECTIFICATION OF ALCOHOL AND THE PREPARATION OF ALCOHOLIC LIQUORS."
SECOND EDITION.

Importance of Testing

12

MANUFACTURE OF VINEGAR.

occur, and should they happen, that he may be able to remove them. It may therefore be said that the entire art of the manufacture of vinegar consists in an accurate knowledge of the conditions of life of the vinegar bacteria and in the induction of these conditions of life. As long as the latter are maintained the process of the formation of vinegar will go on without disturbance, and the origination of new generations of vinegar ferment be connected with the conversion of certain quantities of alcohol into vinegar.

Acidity Testing Evaluation

Vinegar Acidity Testing Fair Share Farm

Sample	MU GWI	FSF	difference
	% acidity	% acidity	
EV44	6.15	5.88	0.27
EV42	5.64	5.50	0.14
EV310	4.36	4.68	-0.32
EC48	5.32	5.38	-0.06
average	5.37	5.36	0.01

Wine from Juice

EW310

Start: 20.5 gallons juice @ 9 °Brix

10 gallon @ 12 °Brix solution

7.7 lbs raw organic sugar

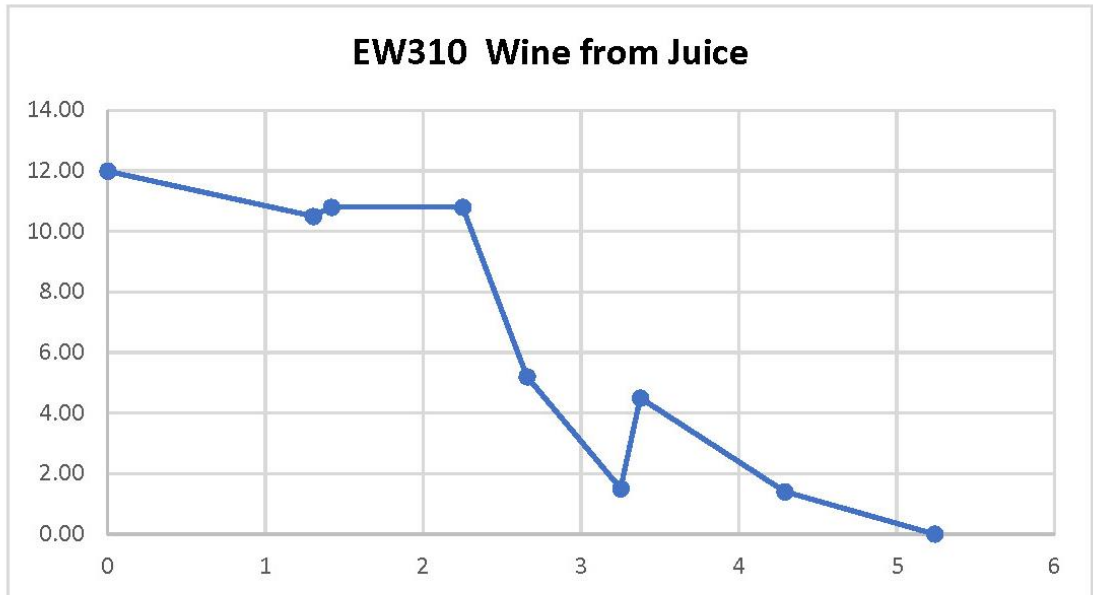
Proofed EC-1118 yeast (*saccharomyces bayanus*)

Ferment to 0 °Brix

Store wine in glass @ 55 °F

Days	°Brix	Temp °F
0	12.00	-
1.30	10.50	67
1.42	10.80	-
2.25	10.80	66
2.66	5.20	-
3.25	1.50	75
3.38	4.50	72
4.29	1.40	68
5.24	0.00	66.00

25 gal wine
5 days



Gunk from Skins



Fair Share Farm

“Cave” Storage



Fair Share Farm

Generator with 13 Gallon Reservoir



Emptying and Refilling Orleans Barrel



Orleans Barrel Mother after Re-fill



Fair Share Farm