



**Breeding Grapes  
for your  
Where & When**



# WHERE





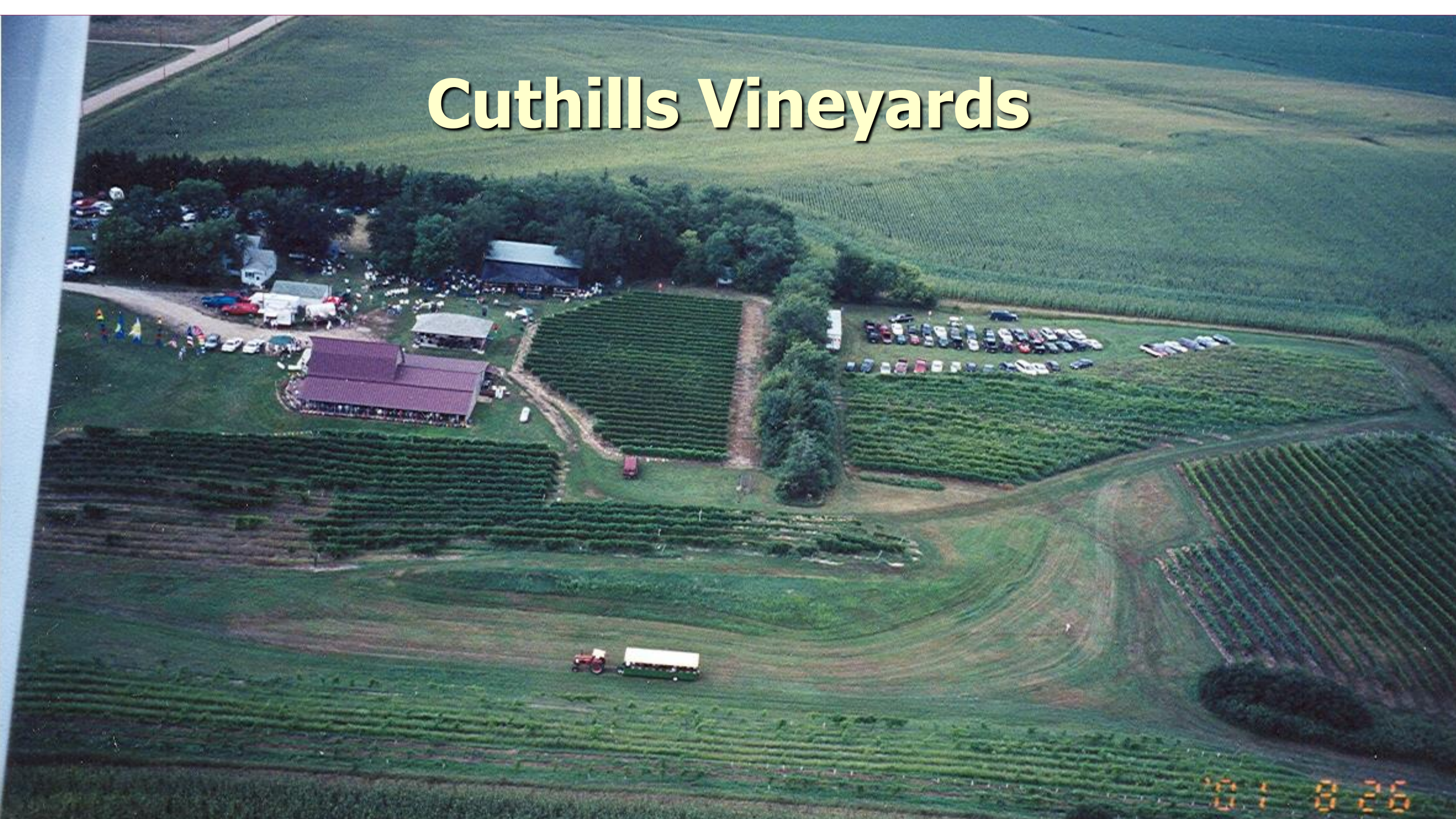
# ELMER SWENSON



**THE MAN WHO INSPIRED ME**



# Cuthills Vineyards



10:08:26



## What we started with in 1984

- LaCrosse
- St.Croix
- Marechal Foch
- deChaunac
- Chancellor
- EXPERIMENTAL
- Vidal
- St.Pepin
- Baco Noir
- Edelweiss
- Steuben
- Reliance



# What we saw in 15 years

- LaCrosse- Consistently good crops, little damage to vines down to -20 F
- St.Croix- Vines are dying in lighter soils, only fair quality wines
- Marechal Foch- Froze to the ground 3 times, poor quality fruit
- deChaunac- Froze to the ground 3 times, inconsistent fruit quality
- Chancellor- Heavy crown gall, downy mildew, vines dying



# What we saw in 15 years

- Vidal- as expected
- St. Pepin- Pistillate vine, poor crops, hard to manage vine
- Baco Noir- I like the leaves for eating
- Edelweiss- freezes to the ground each year
- Steuben- not quite hardy enough here
- Reliance- buds not hardy in coldest years



# Looking for New Cultivars

- David McGregor- Grape Breeder, Dave worked with Elmer and has later unreleased ES grapes as well as his own selections
- Univ. of MN- At this time only numbered selections available outside of Elmer's grapes released through them.
- Cornell-Cold hardiness suspect at this time for this area



# Why Breed New Grapes

- Poor wine quality of existing cultivars
- Poor cold hardiness
- Sensitivity to Phenoxy type Herbicides
- Too early or too late ripening
- Poor disease resistance
- Phyloxera sensitive on roots and attractive leaves for aerial forms
- Too early bud-break
- Lose dormancy mid-winter
- Skins too thin, causing splitting etc.
- The list goes on.....



# Where To Start

## Use only existing Material

Pros- save time, utilize higher quality vines only

Con's- have to take the negative aspects and try to breed away from them

## Start Back at The Species Level and also use existing material

Pros- Introduce new flavors, and other aspects not previously available

Con's- Takes much more time



# Species Selection

- **Tempranillo**- Shorter season Vinifera, good tannin structure
- **Cabernet Franc**- has been a good parent ( Cabernet Sauvignon), one of the more cold hardy Vinifera
- **Sangiovese**- classic Italian variety, offers good aging structure
- **Riparia**- Native American grape species, offers excellent cold hardiness, good disease resistance (depending on where it is from), allows root phylloxera to feed without reaction, offers a parent with shorter growing season than Vinifera

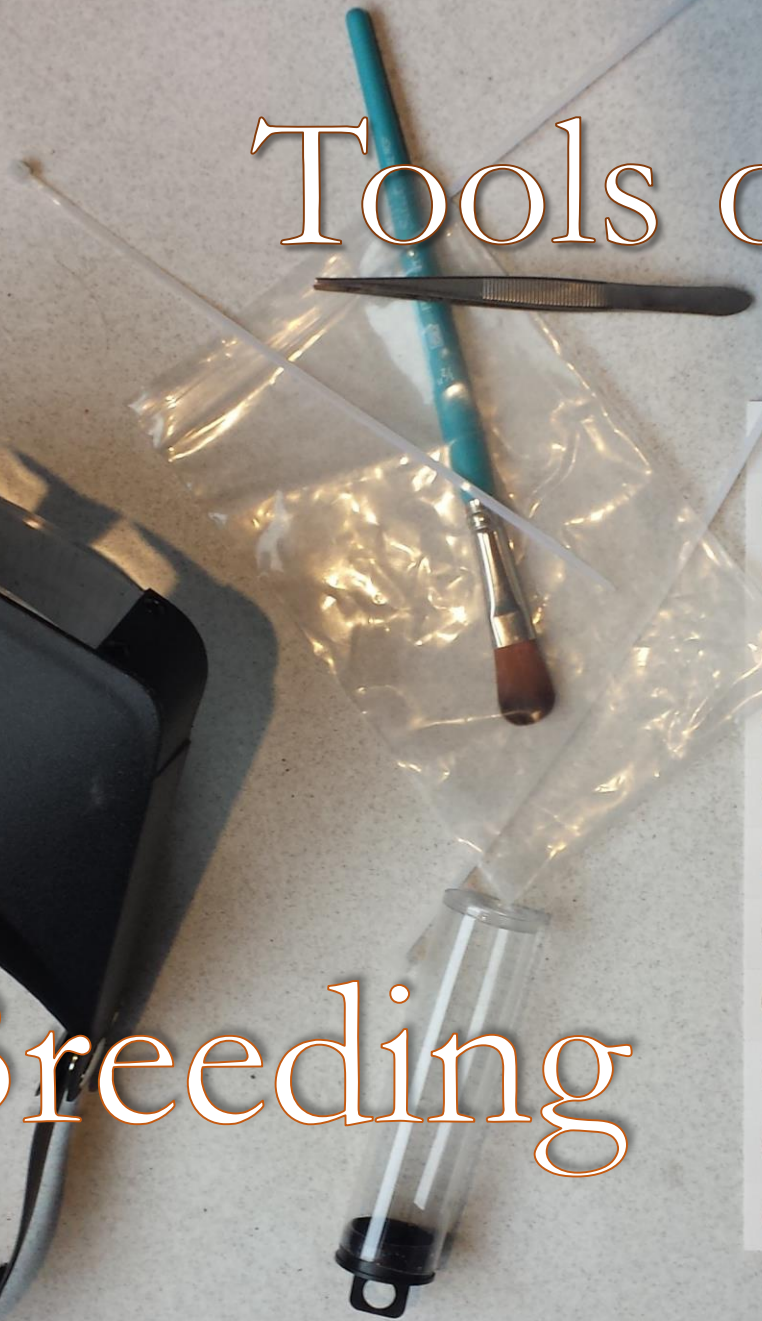
# Sourcing Breeding Material

- Tempranillo- Pollen Parent- Dr. David Sugar Oregon State Univ.
- Cabernet Franc- Pollen Parent – same source
- Sangiovese- Pollen Parent – same source
- Riparia- Seed Parent- Carefully selected from the wild within a 50 mile radius of Pierce, NE



# Tools of the Trade

# Grape Breeding



GEL  
"DONOT EAT"  
THROW AWAY  
DESICCANT  
SILICA  
"DONOT EAT"

MIXED  
RESIN

SILICA



# The First Step- the birds & the bee's



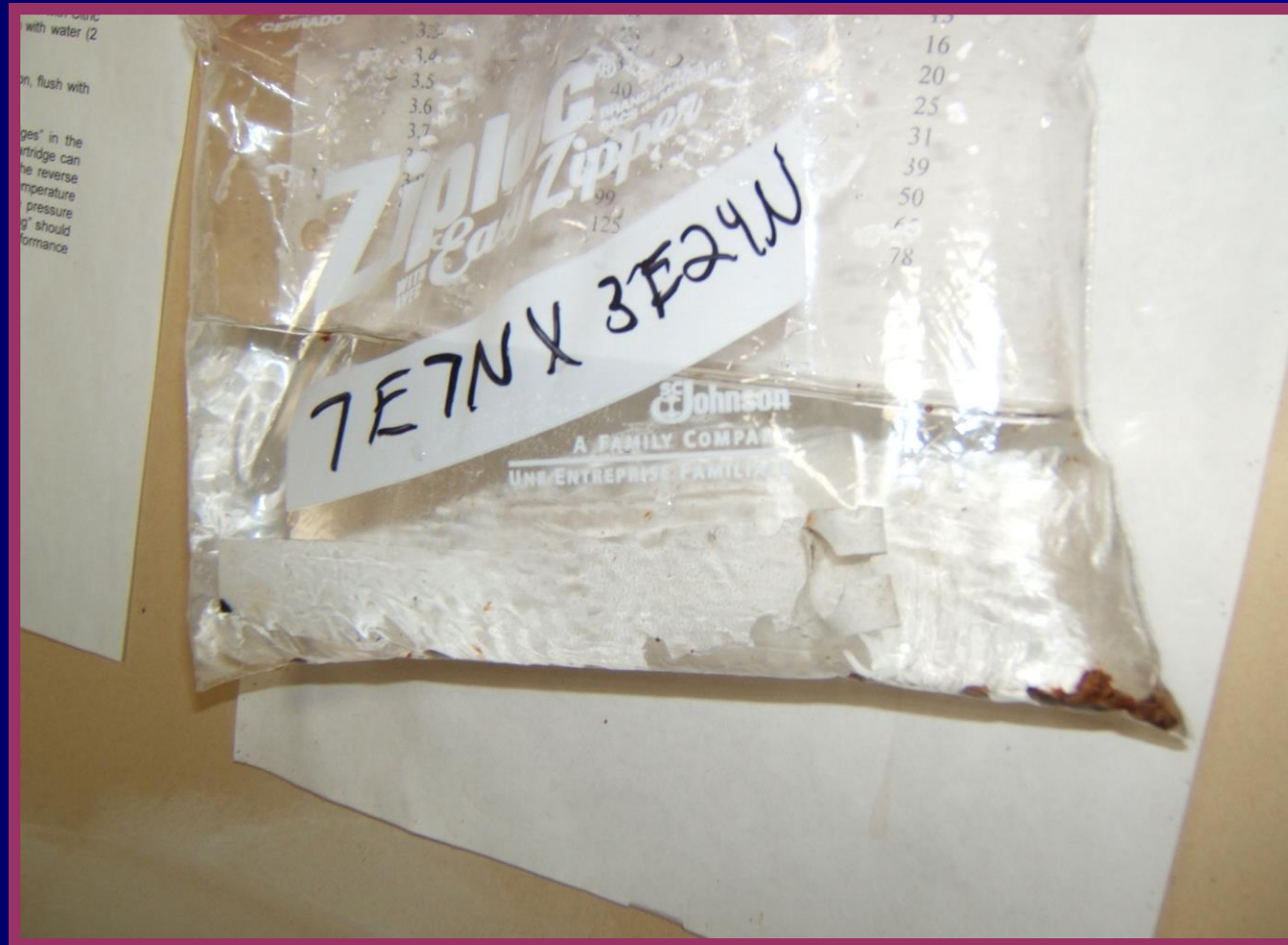
Photo Courtesy Bruce Reisch Cornell University



# Removing seeds from grapes & cleaning



**Seeds cleaned periodically in ozonated water while being stratified for 12 weeks at 38-40 F.**





# NEW GRAPE BABIES





# New Seedlings





# Seedling in it's first year





# Main Hybrid Vineyard





# Mature seedling with fruit



# What to do when you see something promising

- Remember, there is no perfect grape. What works in one location may not work in another, everything is relative.
- You can only select for your location, if your grapes work in a different region you've done better than winning the lottery.



# What's the next step

- Here is where we get the jump on many grape breeding programs

1. Take as much wood as you can possibly spare
2. Don't worry if its not enough wood for cuttings, that will come later. With each individual bud you have the potential for 10 or more lbs. of fruit in just the second year.
3. In the spring after the wood is taken- GRAFT..

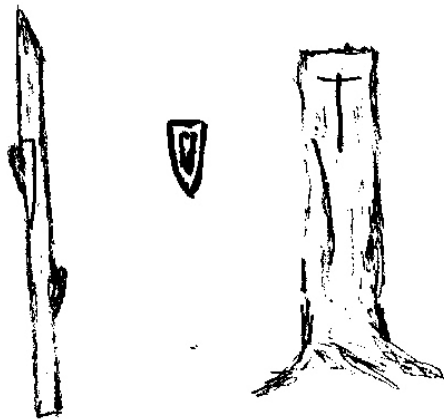
# Grafting

A collection of grafting tools is laid out on a light-colored surface. The tools include a hammer with a red handle and a metal head, a large knife with a black handle and a green blade, a folding knife with a red handle and a yellow blade, a utility knife with a brown handle and a gold blade, a pencil, a utility knife with a red handle and a silver blade, a roll of white tape, and a black marker. A canvas tool bag is also present, containing a green block, a utility knife, and a roll of white tape. Several strips of white tape are scattered around the tools.

Tools of the Trade



# T-Bud





# First year after Grafting





# Temparia ( Riparia x Tempranillo)



# Temparia= Riparia x Tempranillo

- Medium tannins
- Acid = often over 13g/ Liter
- Brix= 21-25
- pH=3.2-3.5
- Berries 1g, clusters avg. 100g
- Vigorous, but easy to manage
- Hardy to -26F, always has a crop
- First commercial variety bred for Nebraska
- Moderately susceptible to 2-4-D, slightly susceptible to Dicamba





**10W14N**



# 10W14N-Parentage

- (Riparia x Cabernet Franc) X (St. Croix x Calzin)
- Calzin = Zinfandel x Mondeuse
- Mondeuse - Either a grandparent or half sibling to Syrah.
- Semi-upright growth habit
- Small clusters and berries
- Disease tolerant ( Only powdery on some unsprayed vines)
- Only somewhat susceptible to 2-4-D & Dicamba
- Hardy to -19 F



# 10W14N

<b>Date</b>	<b>Brix</b>	<b>pH</b>	<b>TA G/L</b>
<b>09/05/17</b> <i><u>Mother</u></i> <i><u>Vine</u></i>	<b>24.5</b>	<b>3.58</b>	<b>9</b>
<b>09/10/18</b>	<b>22</b>	<b>3.3</b>	<b>7.8</b>
<b>09/22/19</b>	<b>22.3</b>	<b>3.37</b>	<b>11.18</b>



9E3N



9E3N



# 9E3N-Parentage

- (Riparia x Cabernet Franc) X (DM-95-16)
- DM-95-16- parentage contains: Merlot, Chambourcin
- Semi-upright growth habit
- Medium loose clusters. Medium berries
- Must control Phomopsis with early sprays
- Moderately susceptible to 2-4-D & Dicamba
- Hardy to -19 F
- Thick, tough skins

# 9E3N

<b>Date</b>	<b>Brix</b>	<b>pH</b>	<b>TA G/L</b>
<b>09/28/17</b>	<b>21</b>	<b>3.32</b>	<b>12</b>
<b>10/12/18</b>	<b>21.5</b>	<b>3.35</b>	<b>7.7</b>
<b>10/02/19</b>	<b>19.8</b>	<b>3.34</b>	<b>6.75</b>





**9E73S**

9E73S- Parentage  
Prairie Star  
X  
(Riparia x  
Sangiovese)





**5E45N**





# 5E45N= St.Croix x Calzin( Zinfandel x Mondeuse )

- Mega tannins
- Nice berry ( 2g ) and cluster size ( avg. 200 )
- Medium vigor
- 2009 was first year to fruit
- Well balanced fruit, acid a little high
- Tough, thick skins

# 1E16S (Riparia x Tempranillo) X Calzin (Zinfandel x Mondeuse )

- Medium Tannins with mostly black current, only hardy to -23F. Good producer.
- Used in breeding with St. Croix x Calzin.
- Good tolerance to 2,4-D





# 1E16S=(Riparia x Tempranillo) x Calzin

- Semi-upright growth, short internodes
- Small berries(1.5g), small clusters ( 150g ),  
Brix=avg. 23, TA= 9 g/L, pH= 3.3
- Concentrated dark fruit with stable color
- Black currant, and some other herbaceous flavors  
if under-ripe
- 50% primary damage at -23F
- Disease resistant
- Only slightly susceptible to 2-4-D, Dicamba

# 4E55N = Riparia x Cabernet Franc

- Very good tannins
- No herbaceous character
- Very good numbers
- Fully hardy in NE Nebraska
- Only Bad—it's Pistillate
- Doing extensive breeding with other top Hybrids



# St.Croix X Calzin (Zinfandel x Mondeuse)

## CV-SCC

- Long Loose clusters, only one or two/shoot.
- Hardy to -25F.
- Medium plus tannins
- This vine was crossed with CV-RTC
- Good tolerance to 2,4-D







CV-SCC



# 5E66N=St.Croix x Calzin ( Zinfandel x Mondeuse )

- Highly tannic red (thick leathery skins), with some tobacco notes from St. Croix.
- Tests with various reds revealed improvement with as little as 10% addition.
- Good tolerance to 2-4-D





# Dormant (hardwood) cuttings being rooted





# Propagation by herbaceous cuttings





# Propagation by herbaceous cuttings







# Blend- 90% 10W14N, 10% 9E3N

• **pH - 3.68**

• **TA - 7.8 g/L**

• **Alc.- 13.1**

- Un-fined, un-filtered
- Brio yeast
- Silka ML bacteria
- pH adjusted on 10W14N, 9E3N chaptalized to 23 brix
- No other additions were made
- Racked twice