Cooperative Education Report

To Study Quantity and Quality of Zinfandel variety

By
Miss Rung Anun
B4651130

Part of Course 302491 Cooperative Education
School of Crop Production Technology
Institute of Agicultural Technology
Suranaree University of Technology
9 August 2006

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Work at
Xichang Chiatai Wine and Spirits Co.,Ltd.
Da Ying. Xichang. Sichuan. China 615000

Abstract

The clusters are compact and full and the berry stems (*peduncles*) somewhat short. These factors make Zinfandel somewhat susceptible to bunch rot and some types of mildew. Water management is particularly critical to raising Zinfandel. Under stress from lack of moisture, it is prone to raisining. It also ripens more unevenly than most other varieties and it is not uncommon for green and raisined berries to occur within the same cluster.company get yield quantity and quanlity of grapes for a benefit of data in wine for dispense. Design of plan experiment on diagonal perfect. Random grapes 40 truck .Then keep data in assess quantity to count fruit per cluster is 266 fruit per cluster, to count cluster per trunk is 24 cluster per trunk and to weigh kilogramme per rai is 243 kilogramme per rai. Keep data in assess quanlity, evalugte % brix by hand refractometer. The highest above have quantity of sugar is 13 ,next to midle have quantity of sugar is 13 , the least have quantity of sugar is 11 and total quantity of sugar is 12.This area for experiment have quantity of fertiizer in soil is nitrogen 0.0862 percent , phosphorus 0.51 percent and potassium 1.783 percent. Take quantity and quality of Zinfandel grapes and Merlot grapes to compare. Assess merlot grapes quantity have less than zinfandel grapes but assess merlot grapes quantity of sugar have more than zinfandel grapes.

Xichang Chiatai Wine & Spirits Co.,Ltd.
Da Ying. Xichang. Sichuan. China
615000

8 August 2006

Subject Send Cooperative Education Report
Inform Asst. Prof. Dr. Yuvadee Manakasem
  School of Crop Production Technology

  My name is Miss Rung Anun, a student in School of
Crop Production Technology, Institute of Agricultural Technology,
Suranaree University of Technology, had Cooperative Education
starting from 18 April 2006 to 4 August 2006. In job position is
technician in vineyard and winery of Xichang Chiatai Wine and
Spirits Co.,Ltd., Xichang Sichuan, China. Job supervisor assign me
to study and gather data in subject " To Study Quantity and
Quality of Zinfandel variety "

  Now, Cooperative Education have finish. I have intention
to send Cooperative Education Report for agree to your suggestion.

  Thank for following along

  Your Sincerely

  (Miss Rung Anun)
  Cooperative Education Student
  School of Crop Production Technology

Acknowledgment

I had Cooperative Education starting from 18 April 2006 to 4 August 2006. In job position is technician in vineyard and winery of Xichang Chiatai Wine and Spirits Co.,Ltd., Xichang Sichuan, P.R.China. I have new experience, knowledge about cultivation, understand about working and Chinese language. All are my enormous worth. And this report can finish because of cooperative and support from party, as follow :

1. Mr. Vason Boonterm   (General Manager)
2. Mr. Udomsak Pirunproi   (Special List)
3. Mr. Phajon Yuyuen   (Winemaker)
4. Mr. Huang Jer Jin   (Vineyard Manager) , job superviser
5. Mr. Jo Lin   (Contact Vineyard Manager)
6. Mr. Juwei   (Translate)

And another people that I don't refer who give a suggestion and assistance.

I am grateful to every people who give a suggestion, assistance, and opportunity cause of this report succeed. Thank you very much.

Miss Rung Anun
Reporter
8 August 2006

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About Moon Valley
Xichang ChiaTai Wine & Spirit Industry Co., Ltd.

正大集团
CHIA TAI GROUP

The second generation of CP management group, from left to right: Mr. Dhanin Chearavanont, Mr. JaranChearavanont, Mr.Montri Chearavanont & Mr. Sumet Chearavanont.

Xichang Chia Tai Wine & Spirit Co., Ltd is the first grape wine production company set up by CP Group in China

In 1997, CP began to invest in Da Ying farm area, Xichang city to construct a grape yard. Fine young plants of grapes for wine brewage and brewing lines are imported from America. Mr. Brent, an American expert has also been invited to the company responsible for production and quality control.

The company is now turning out 3000 tons of wines for each year. The dry red wine Moon Valley is our product representing a high quality and good taste, same as other good brands in the market.

Address : Xichang Chia Tai Wine & Spirit Industry Co., Ltd

Da Ying Farm, Xichang District, Sichuan Province, PR. China

Chiatai Group is a transnationed coororation, its headquartor sets in Thailand. In China, it has more than 190 sulsidary companies. Xichang Chiatai Wine and Spirit Co.,Ltd is one of the branches, it set up in Xichang of Sichuan province.

This company founded in 1997, through wine experts perambulation and analysis, they found this place has enough sunlight, fitful rainfall, and the air is very fresh, day and night temperature has large distinction, all these conditions is suitable for grape's planting. In 1998, We began to build our own vineyard, We also build up our winery, all of the equipments in winery we're imported from Italy., our products contain "Yeguganhong" and "moon valley" dry red wine.

Moon Valley is a premium wine, great quality, which has been delicately processed, starting from the best grape variety selection from NAPA Valley, U.S.A. The selected varieties are Cabernet sauvignon, Zinfandel, Merlot. They were brought in to cultivate at Xichang, Sichuan, China were the climate and environment are suitable to the growing of the tea. There, a manufacture with new modern with new modern and high technology is launched in order to be able to brew wine with freshly picked grape under a close and delicate control of winemaker from the U.S.A. and Thailand. "Moon Valley" wine almost have fruity, bouquet aroma, and full bodied, it's smooth and enjoyable wine, good as drinking to maintain good heath or to celebrate special occasions.

We use noble European Varieties grape such as Carbernet sauvignon, Zinfandel, Merlot ect., grown in Liangshan, Sichuan, China, an area whose unique picturesque beauty and suitable climate imparts an excellence in the grapes.

Winery

We make wine with art and technology that we have modern equipment for wine process.

Our Product

We use noble European grape variety such as Cabernet S., Merlot, Zinfandel, ect., grown and produced in Liangshan, Sichuan, China, an area whose unique picturesque beauty and suitable climate imparts an excellence in the grapes ultimately this enjoyable wine.

Product Introduction
Wine

Work at to receive assign to be an apprentice

Month 1   Take care of a vineyard
Month 2   Function of a leader to control worker
Month 3   Produce of grapes to gather data
Month 4   Produce wine

Project
Subject : To Study Quantity and Quality of Zinfandel variety

Chapter 1
Signifi cant of this study

Grape is *Vitis* lineage and *Vitacea* family. *Vitis* lineage is only lineage of fruit for eating.

Grapes is a climbing, perennial plant. It is moderately vigorous and requires a long, warm, abundantly sunny growing season with hot days and cool nights to fully develop its flavors and maintain acidity. The vine is best suited to thin, minerally, well-drained soils which help curb is high productivity. Grapes to be divide 2 type :

Fresh grape and wine grape. A part of fresh grape is divide seedless and seed. The part of wine grape is divide red wine and white wine.

Each kinds of variety. In part of experiment study of red wine "Zinfandel type".

Zinfandel as a red wine can be made light and fruity, much like French *Beaujolais*, or lively, complex and age worthy, like Cabernet or *claret*. It can also be made into big, ripe, high alcohol style wines that resemble *Port*. Zinfandel is also a component of most California "jug" wines, since it is the most widely planted red wine grape.

The clusters are compact and full and the berry stems (*peduncles*) somewhat short. These factors make Zinfandel somewhat susceptible to bunch rot and some types of mildew. Water management is particularly critical to raising Zinfandel. Under stress from lack of moisture, it is prone to raisining. It also ripens more unevenly than most other varieties and it is not uncommon for green and raisined berries to occur within the same cluster. This tendency to can be aggravated by poorly-timed irrigation. Uneven ripening also means that machine-picking is impractical and a Zinfandel vineyard may often require a few passes, days apart, to harvest all the fruit with the same level of maturity.

Because of its vigor, generosity and resistance to vine disease, many zinfandel vineyards exist that are 75 to 100 or more years old. Zinfandel aficionados believe these "old vines" produce the best wines, because the older vineyards set smaller crops and the grapes tend to ripen more evenly.

At its best, Zinfandel (red) has a very fruity, raspberry-like aroma and flavor and a "jammy" quality. The most common aroma and flavor descriptors used with Zinfandel are Zinfandel is one red varietal that is probably best enjoyed in its youth, within three to five years of the vintage. With more bottle age than this, the luscious fruit that distinguishes Zinfandel drops markedly and the wine can show a pronounced "hot" taste of higher alcohol levels and become more neutrally *vinous*. It is sometimes hard even for experienced tasters to pick

an older Zinfandel from among similar-aged Cabernet Sauvignon, for instance (not that there's anything wrong with that).

A level is good quality. Although young wine can drink to delicious. It can keep to ripen for long time but it is not like that always.

It is depend on many factors to make wine. In producing wine grape to have quality of type as mentioned. It will too many practice such as manage leave and the slender stem of a vine for to take proper of light, have control yields not too many, use hormone for improve size and color and then this special method is practice in Laboratory as to measure % Brix.

Objective

- Get yield quantity of Zinfandel in ratio kilogram per Rai, a cluster per truck, fruit per a cluster in 2006
- For assess quality of Zinfandel in 2006
- For compare Zinfandel and Merlot of quantity and quality
- To learn working in system and process
- For increase experience from working

Obtain a result

- For student get yield quantity and quality of grapes in efficiency
- Student have more experience form working
- Company get yield quantity and quality of grapes for a benefit of data in wine for dispense.
- Student and company are to exchange new knowledge for experience and improve in to study and working for future

Chapter 2
Materials an equipment and Method to experiment

1. Plan experiment

Design of plan experiment on diagonal perfect. Random grapes 40 trunk from grapes 404 trunk. Then keep data in assess quantity to count fruit per cluster, to count cluster per trunk and to weigh kilogram per rai. When harvest stage will weigh and calculate. Keep data in assess quality, evaluate % brix by hand refractometer. And total of data bring to compare with other experiment is data of assess quantity and quality of Merlot by soil analyze at Xichang Chia tai Wine & Spirits Co.,Ltd. In compare.

Method of random grapes
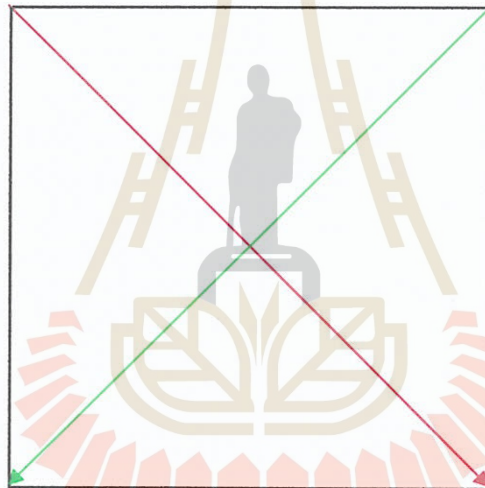
A 1-20
Direction from left to right
B 21-40
Direction from right to left

2. Prepare of grapes

Total area of Zinfandel grapes have about 1133 m^2, grapes 404 truck, row of grapes 23 line, row of grapes have be comparable, the least row of grapes have 6 truck, the extreme row of grapes have 27 truck and everage row of grapes have 22 truck. That canopy management practice and pruning same every truck.

3. Harvest of grapes

Harvest of Zinfandel when 3 months after bloom of flower grapes 100 % about 19 April 2006. Harvest of Zinfandel about 30 July 2006. Take of yield random to evaluate % brix, select grapes random 5 cluster per truck, 6 Fruit per cluster by select 2 fruit above, 2 fruit middle and 2 fruit down. Process to evaluate % brix total. Take of yield total form random to weigh for calculate kilogram per rai

Chapter 3
Result

1. Data of Soil Analyze

Data of Soil Analyze in Xichang Chia Tai Wine & Spirits Co.,Ltd. In compare is data of soil analyze of all Zone A in 2006/4/24 to prepare a questionnaire gather data of soil in each area area 18 point to have so data of soil analyze

Table 1 Data of soil analyze (2006)

Sample name	N %	P %	K %	cmol(1/2 Ca^{2+})/kg	cmol(1/2 Mg^{2+})/kg	pH
3A-3	0.0862	0.051	1.783	6.795	3.827	4.55
3A-5	0.0789	0.090	1.288	7.645	2.445	5.51
3A-6	0.1068	0.065	1.520	9.248	4.779	5.84

2. Data of Count Fruit Grapes Per Cluster Line Zinfandel and Merlot

Data of count fruit grapes Per cluster this to make gather data by count fruit grapes all 20 trunk trunk 1 cluster to have so data

Table 2.1 Data of count fruit grapes per cluster Line Zinfandel (2006)

No.	Row	Truck	Amount (Fruit/Cluster)
1	1	1	180
2	3	3	300
3	5	4	155
4	7	7	264
5	8	8	332
6	9	9	280
7	10	10	290
8	11	11	202
9	12	12	171
10	13	13	446
11	14	13	230
12	15	14	147
13	16	15	169
14	17	16	288
15	18	17	230
16	19	18	636
17	20	19	238
18	21	20	266
19	22	21	286
20	23	22	223

Summarize grapes 1 cluster to have number fruit grapes estimate 266 fruit per cluster

Table 2.2 Data of count fruit grapes per cluster
Line Merlot (2006)

No.	Row	Truck	Amount (Fruit/Cluster)
1	1	1	127
2	2	2	168
3	3	3	154
4	4	4	96
5	5	5	79
6	6	6	103
7	7	7	87
8	8	8	120
9	9	9	86
10	10	10	90
11	1	21	98
12	2	22	103
13	3	23	109
14	4	24	118
15	5	25	113
16	6	26	57
17	7	27	55
18	8	28	62
19	9	29	59
20	10	30	70

Summarize grapes 1 cluster to have number fruit grapes estimate 98 fruit per cluster

3. Data of Count Cluster Per Truck Line Zinfandel

Data of count cluster grapes Per trunk this to make gather data by of count all cluster grapes design by experiment plan on diagonal perfect to have an amount trunk grapes all 40 trunk to have so data

Table 3.1 Data of count cluster per truck design by experiment plan on diagonal perfect from left to right direction
Line Zinfandel A 1-20 (2006)

Row	Truck	Amount (Cluster/Truck)
1	1	27
3	3	33
5	4	28
7	7	28
8	8	33
9	9	22
10	10	24
11	11	29
12	12	22
13	13	19
14	13	26
15	14	20
16	15	18
17	16	25
18	17	24
19	18	24
20	19	33
21	20	23
22	21	21
23	22	35

Table 3.2 Data of count cluster per truck to design by experiment plan on diagonal perfect from right to left direction Line Zinfandel B 21-40 (2006)

Row	Truck	Amount (Cluster/Truck)
1	19	32
3	18	25
5	17	23
7	16	23
8	15	27
9	14	18
10	13	20
11	12	19
12	11	29
13	10	22
14	9	20
15	9	30
16	8	26
17	7	18
18	6	20
19	5	17
20	4	18
21	3	17
22	2	25
23	1	21

Summarize grapes 1 trunk to have number cluster grapes estimate 24 cluster per trunk

4. Data of Count Cluster Per Truck Line Merlot

Data of count cluster grapes/trunk this to make gather data by of count all cluster grapes design by experiment plan on diagonal perfect to have an amount trunk grapes all 40 trunk to have so data

Table 4.1 Data of count cluster per truck design by experiment plan on diagonal perfect from left to right direction Line Merlot A 1-20 (2006)

Row	Truck	Amount (Cluster/Truck)
1	1	21
2	2	19
3	3	22
4	4	5
5	5	8
6	6	6
7	7	10
8	8	9
9	9	8
10	10	11
11	11	8
12	12	20
13	13	15
14	14	15
15	15	12
16	16	19
17	17	21
18	18	21
19	19	11
20	20	5

16

Table 4.2 Data of count cluster per truck to design by experiment plan on diagonal perfect from right to left direction Line Merlot B 21-40 (2006)

Row	Truck	Amount (Cluster/Truck)
1	34	8
2	33	8
3	29	21
4	30	14
5	28	8
6	27	5
7	26	13
8	25	11
9	25	20
10	24	17
11	23	13
12	23	14
13	26	18
14	15	23
15	14	4
16	9	-
17	3	7
18	2	15
19	3	19
20	4	16

Summarize grapes 1 trunk to have number cluster grapes estimate 13 cluster per trunk

5. Data of Kilogramme Per Truck Line Zinfandel

Table 5.1 Data of Kilogramme per truck design by experiment plan on diagonal perfect from left to right direction Line Zinfandel A 1-20 (2006)

Row	Truck	Kilogramme (Weight/Truck)
1	1	9.1
3	3	11.4
5	4	8
7	7	10.7
8	8	10.8
9	9	7.4
10	10	9.4
11	11	10.5
12	12	8.5
13	13	8.9
14	13	10.5
15	14	8.1
16	15	7.5
17	16	7.2
18	17	7.3
19	18	10.4
20	19	5.1
21	20	6.7
22	21	9
23	22	7.7

Table 5.2 Data of Kilogramme per truck design by experiment plan on diagonal perfect from right to left direction Line Zinfandel B 21-40 (2006)

Row	Truck	Kilogramme (Weight/Truck)
1	19	8.5
3	18	7.8
5	17	7.2
7	16	9.1
8	15	10.4
9	14	6.9
10	13	7.3
11	12	8.8
12	11	10.5
13	10	8.1
14	9	6.6
15	9	9.8
16	8	10.6
17	7	9.5
18	6	10.5
19	5	8.2
20	4	8.3
21	3	6.8
22	2	5.2
23	1	10.2

Summarize grapes 40 trunk to have weight total 343.5 kg. per area 1133 m^2. If to have area 1600 m^2 will to have weight 243.24 kg.

6. Data of Kilogramme Per Truck Line Merlot

Table 6.1 Data of Kilogramme per truck design by experiment plan on diagonal perfect from left to right direction Line Merlot A 1-20 (2006)

Row	Truck	Kilogramme (Weight/Truck)
1	1	4.1
2	2	3.8
3	3	3.1
4	4	1.1
5	5	1.4
6	6	1.1
7	7	1.9
8	8	1.6
9	9	2.0
10	10	1.9
11	11	1.4
12	12	4.4
13	13	1.4
14	14	2.9
15	15	1.6
16	16	2.7
17	17	2.5
18	18	3.0
19	19	1.0
20	20	1.0

Table 6.2 Data of Kilogramme per truck design by experiment plan on diagonal perfect from right to left direction Line Merlot B 21-40 (2006)

Row	Truck	Kilogramme (Weight/Truck)
1	1	1.9
2	3	2.9
3	4	1.1
4	7	1.3
5	8	1.0
6	9	1.3
7	10	1.4
8	11	1.9
9	12	2.9
10	13	2.0
11	13	1.6
12	14	2.0
13	15	2.8
14	16	1.4
15	17	1.3
16	18	-
17	19	1.4
18	20	2.8
19	21	2.0
20	22	2.4

Summarize grapes 40 trunk to have weight total 77 kg. per area 1400 m^2 . If to have area 1600 m^2 will to have weight 88 kg.

7. Data of Percent Brix

Table 7.1 Line Zinfandel

Place of Grapes	% Brix
Above	13
Middle	13
Down	11
Total	12

Table 7.2 Line Merlot

Place of Grapes	% Brix
Above	16.5
Middle	14.5
Down	12.5
Total	15.5

Chapter 4
Conclusion

The primary objective of this study Quantity of Zinfandel variety between Zinfandel and Merlot. They are from count fruit grapes per cluster, cluster grapes per trunk and to weigh kilogram per rai. The results of experiment, therefore it counted fruit grapes per cluster obtained to random grapes 20 trunk ,trunk each 1 cluster. Summarize of Zinfandel had amount about 266 fruits/cluster and Merlot had amount about 98 fruits/cluster. A part of cluster grapes per trunk obtained to random grapes to among experiment process. The results of Zinfandel had amount about 24 clusters/trunk and Merlot had amount about 13 clusters/trunk. And did weigh kilogram per rai. They got all produce 40 trunks to among experiment process. The results of Zinfandel had weigh 243.24kg/rai and Merlot had weigh 88 kg/rai.

To Study Quality the results of experiment from measured % Brix, therefore Zinfandel had %Brix been equal to 12 and would divide 3 parts into 1 cluster.I analyzed measure %Brix on the top was 13 , part of the middle was 13 and part of lower was 11 Merlot had %Brix been equal to 15.5I analyzed measure %Brix on the top was 16.5, part of the middle was 14.5and part of lower was 12.5

The study Quantity and Quality of two variety will have information of soil analyze to compare

Chapter 5
Problem and Suggest

Assign to study and gather data in subject " To Study Quantity and Quality of Zinfandel variety " at Xichang Chia Tai Wine and Spirits Co.,Ltd.,. I had starting from 10 May 2006 to 30 July 2006. All period of time included 11 weeks which during to fuction to find problem and obstacle. That is

1. Because of real fuction at the first time to do first interval is not work very well and had quite faults. Afterwards to be able to adjust oneself and receive instructions from Job Supervisor then I had better work to move with the wind.

2. Because of grapes in zinfandel to have fruit very densely so difficult of count fruit grapes per cluster an effect a result in currect

3. Because of grapes to have Disease then a product partial to damage
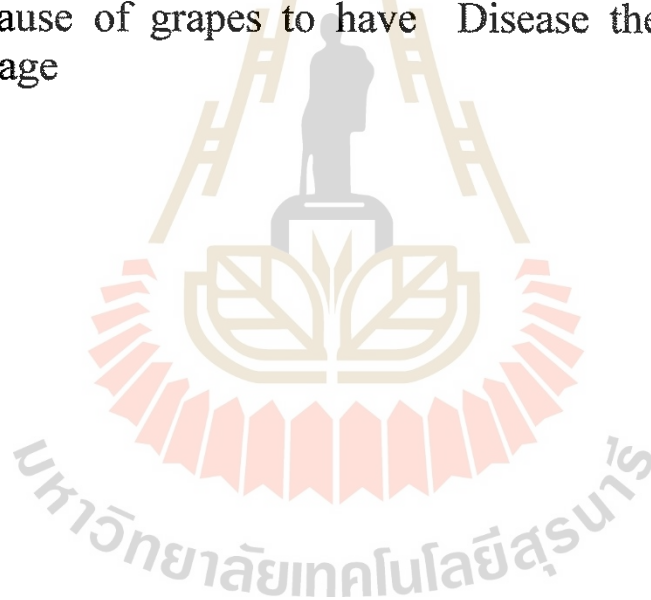
Reference

Data of soil analyse at Xichang Chai Tai Wine & Spirit Co., Ltd.

Online : http://www.zinfandel.net/white_zin.shtml

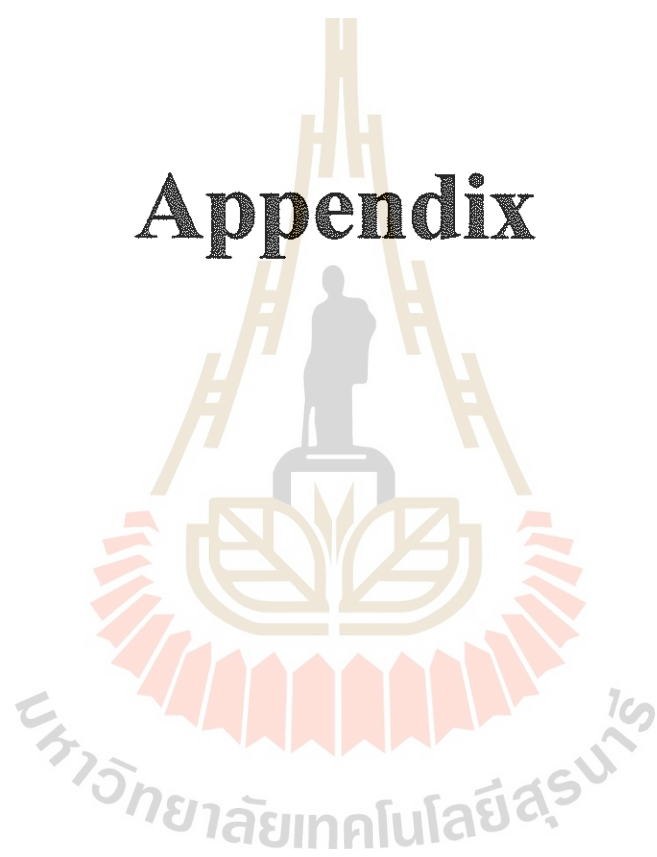Online :http://www.google.co.th/search?q=zinfandel*%25brix&hl=th&lr =&start=40&sa=N

Appendix

Figure 1 Characteristic of bloom zinfandel grapes line to be not mature

Figure 2 Characteristic of bloom merlot grapes line to be not mature

Figure 3 Characteristic of bloom zinfandel grapes line to be mature

Figure 4 Characteristic of bloom merlot grapes line to be mature

Figure5 Characteristic of stalk zinfandel grapes line

Figure 6 Characteristic of stalk merlot grapes line
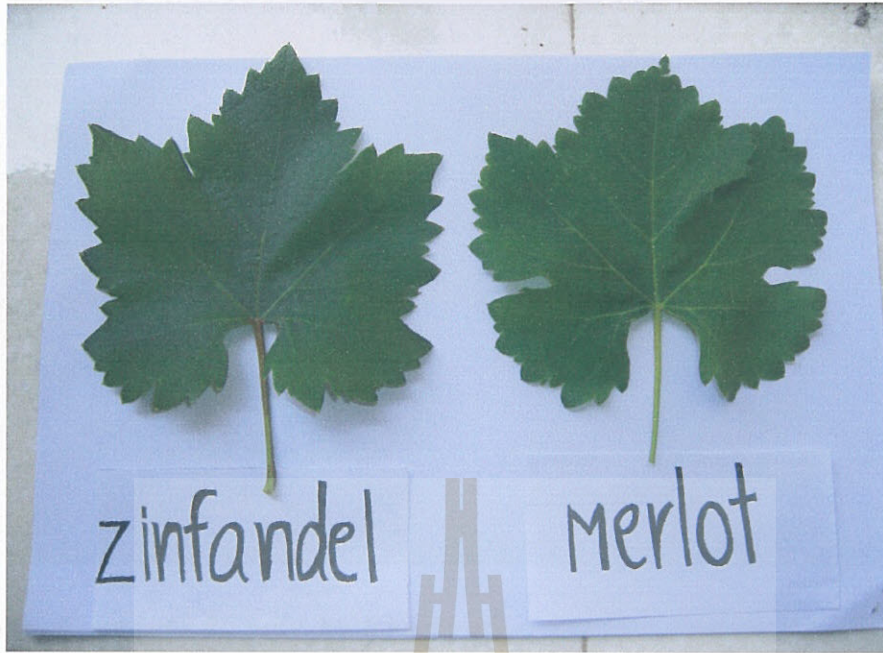
Figure 7 Characteristic of leaf zinfandel and merlot grapes line

Figure 8 Harvest a product grapes line Zinfandel

Figure 9 Evaluate % brix by hand refractometer grapes line Zinfandel