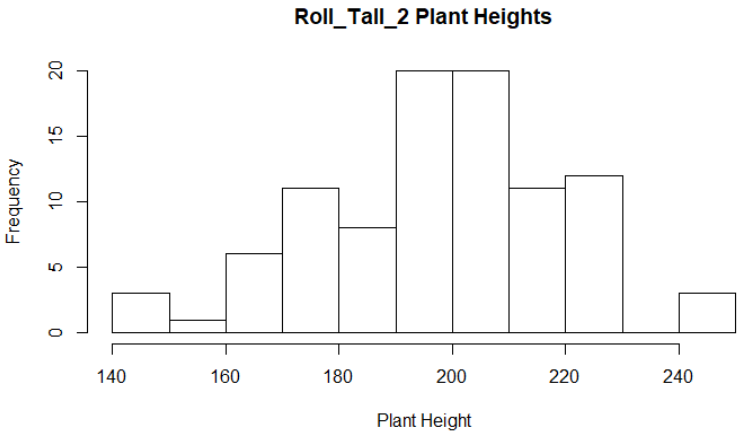
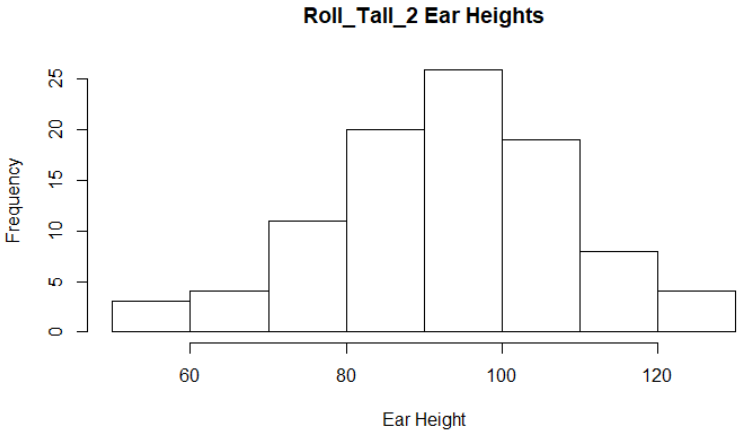
Analyzing phenotypes

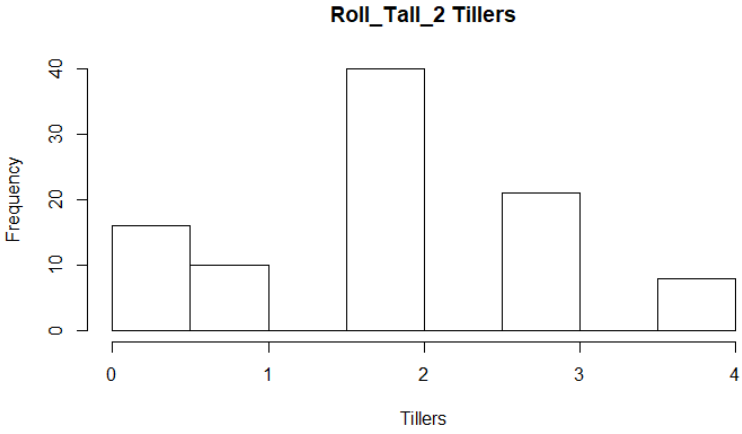
```
setwd("C:\\Users\\Abiskar Gyawali\\OneDrive\\PhD_Mizzou\\Tim's lab\\Shoepeg_GWAS\\Cycle_1")
Roll_Tall_2 <- read.delim("Rollins_Tall_2.txt",header=T,stringsAsFactors=F,sep="\t")
Gen_Short_2 <- read.delim("Genetics_Pinetree_Short_2.txt",header=T,stringsAsFactors=F,sep="\t")
VH_Short_1 <- read.delim("VinyardHighland_Short_1.txt",header=T,stringsAsFactors=F,sep="\t")
VL_Tall_1 <- read.delim("VinyardLowland_Tall_1.txt",header=T,stringsAsFactors=F,sep="\t")
```

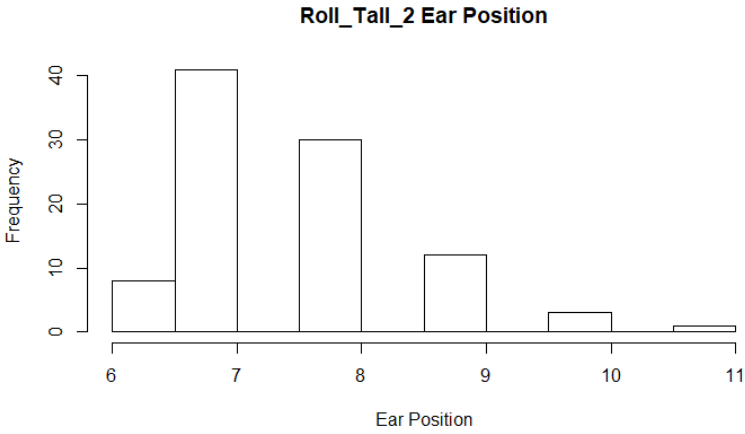
Make Plot for each phenotype in each field

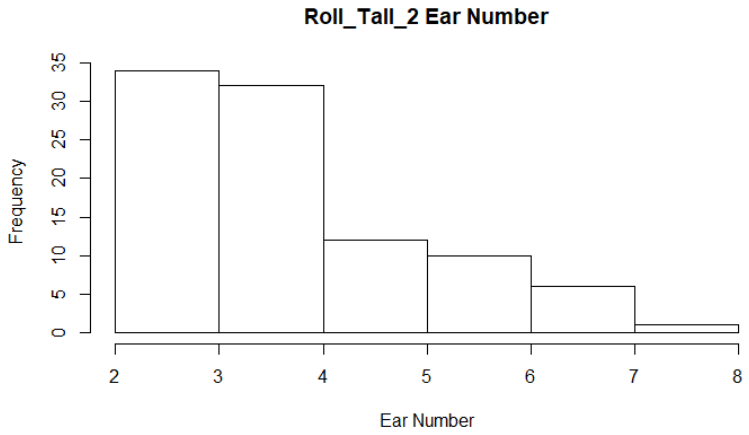
```
## Rollins_Tall_2
hist(Roll_Tall_2$PlantHt, main = "Roll_Tall_2 Plant Heights", xlab = "Plant Height")
hist(Roll_Tall_2$EarHt, main = "Roll_Tall_2 Ear Heights", xlab = "Ear Height")
hist(Roll_Tall_2$EarNumber, main = "Roll_Tall_2 Ear Number", xlab = "Ear Number")
hist(Roll_Tall_2$Tillers, main = "Roll_Tall_2 Tillers", xlab = "Tillers")
hist(Roll_Tall_2$NodeNumber, main = "Roll_Tall_2 Node Number", xlab = "Node Number")
hist(Roll_Tall_2$EarPosition, main = "Roll_Tall_2 Ear Position", xlab = "Ear Position")

## Genetics_PineTree_Short_2
hist(Gen_Short_2$PlantHt, main = "Gen_Short_2 Plant Heights", xlab = "Plant Height")
hist(Gen_Short_2$EarHt, main = "Gen_Short_2 Ear Heights", xlab = "Ear Height")
hist(Gen_Short_2$EarNumber, main = "Gen_Short_2 Ear Number", xlab = "Ear Number")
hist(Gen_Short_2$Tillers, main = "Gen_Short_2 Tillers", xlab = "Tillers")
hist(Gen_Short_2$NodeNumber, main = "Gen_Short_2 Node Number", xlab = "Node Number")
hist(Gen_Short_2$EarPosition, main = "Gen_Short_2 Ear Position", xlab = "Ear Position")

## Vinyard_Highland_Short_1
hist(VH_Short_1$PlantHt, main = "VH_Short_1 Plant Heights", xlab = "Plant Height")
hist(VH_Short_1$EarHt, main = "VH_Short_1 Ear Heights", xlab = "Ear Height")
hist(VH_Short_1$EarNumber, main = "VH_Short_1 Ear Number", xlab = "Ear Number")
hist(VH_Short_1$Tillers, main = "VH_Short_1 Tillers", xlab = "Tillers")
hist(VH_Short_1$NodeNumber, main = "VH_Short_1 Node Number", xlab = "Node Number")
hist(VH_Short_1$EarPosition, main = "VH_Short_1 Ear Position", xlab = "Ear Position")

## Vinyard_Lowland_Tall_1
hist(VL_Tall_1$PlantHt, main = "VL_Tall_1 Plant Heights", xlab = "Plant Height")
hist(VL_Tall_1$EarHt, main = "VL_Tall_1 Ear Heights", xlab = "Ear Height")
hist(VL_Tall_1$EarNumber, main = "VL_Tall_1 Ear Number", xlab = "Ear Number")
hist(VL_Tall_1$Tillers, main = "VL_Tall_1 Tillers", xlab = "Tillers")
hist(VL_Tall_1$NodeNumber, main = "VL_Tall_1 Node Number", xlab = "Node Number")
hist(VL_Tall_1$EarPosition, main = "VL_Tall_1 Ear Position", xlab = "Ear Position")
```

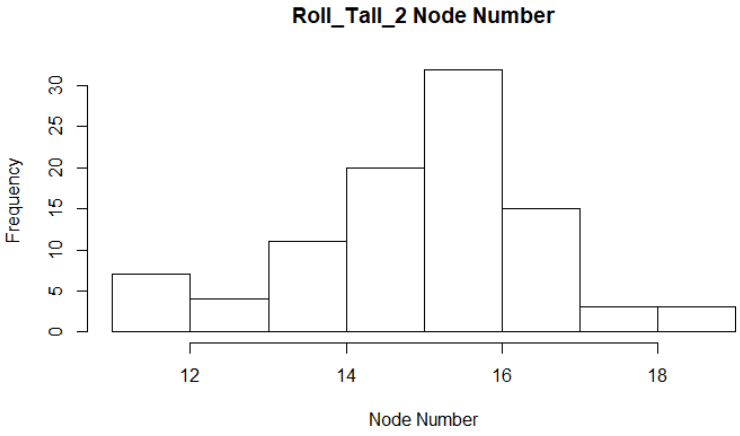

Roll_Tall_2 Plant Heights
Frequency
0
5
10
15
20
140
160
180
200
220
240
Plant Height


Roll_Tall_2 Ear Heights
Frequency
0
5
10
15
20
25
60
80
100
120
Ear Height


Roll_Tall_2 Tillers
Frequency
0
10
20
30
40
0
1
2
3
4
Tillers

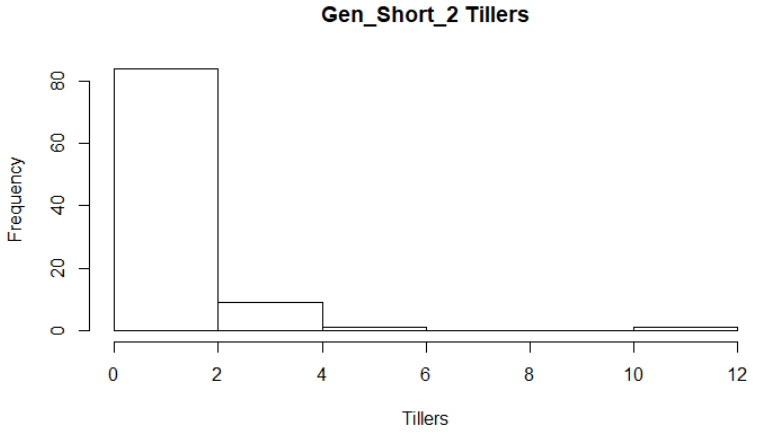

Roll_Tall_2 Ear Position
Frequency
0
10
20
30
40
6
7
8
9
10
11
Ear Position

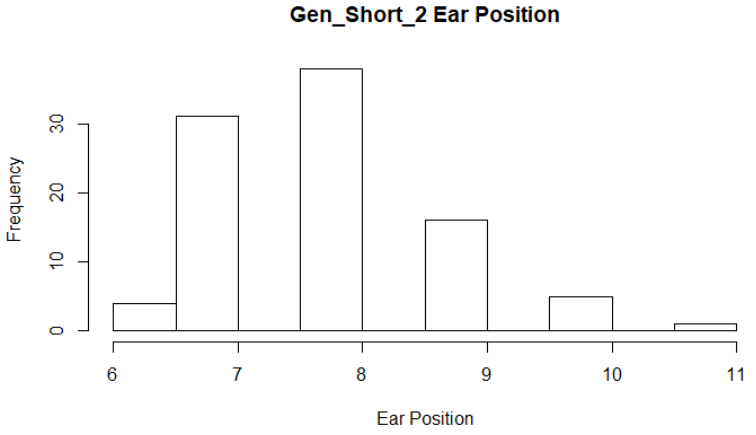

Roll_Tall_2 Ear Number
Frequency
0
5
10
15
20
25
30
35
2
3
4
5
6
7
8
Ear Number

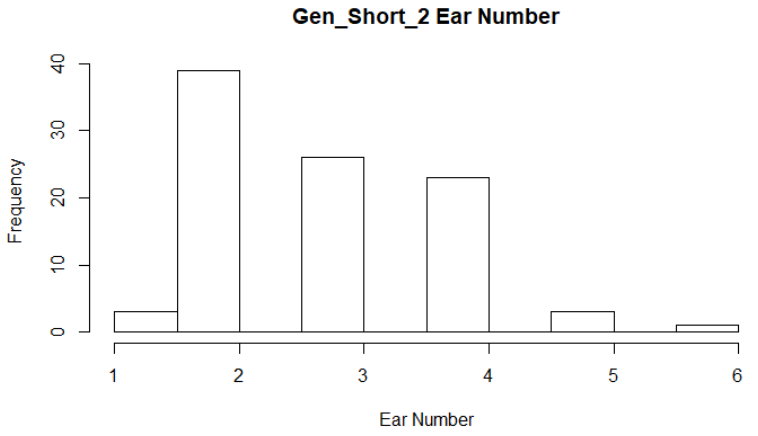

Roll_Tall_2 Node Number
Frequency
0
5
10
15
20
25
30
12
14
16
18
Node Number

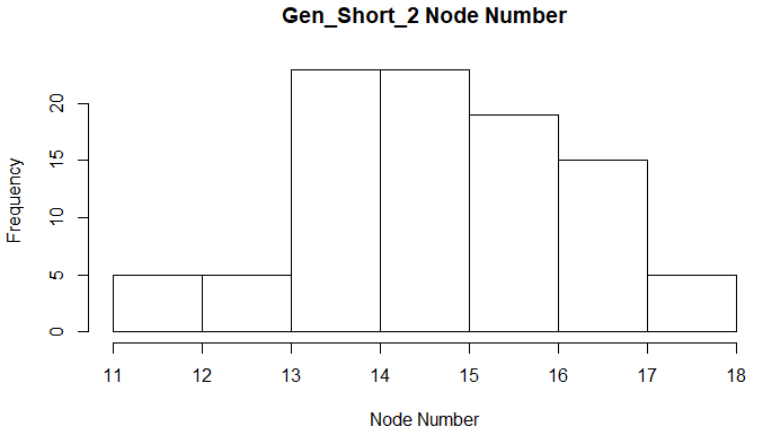
Gen_Short_2 Plant Heights
Frequency
0
5
10
15
20
120
140
160
180
200
220
Plant Height

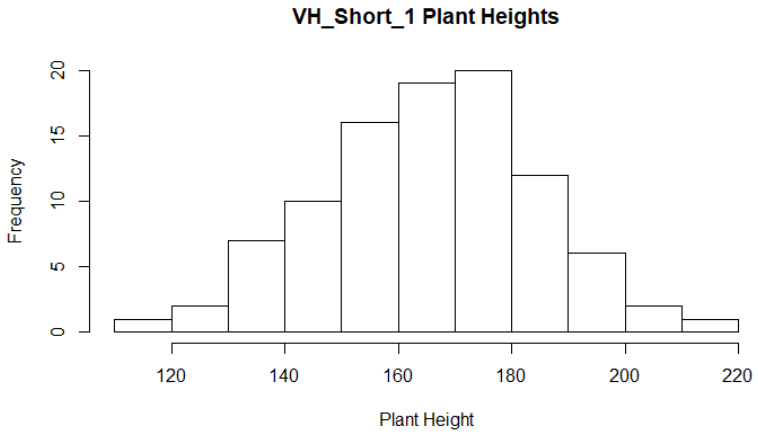
Gen_Short_2 Ear Heights
Frequency
0
5
10
15
60
70
80
90
100
110
Ear Height

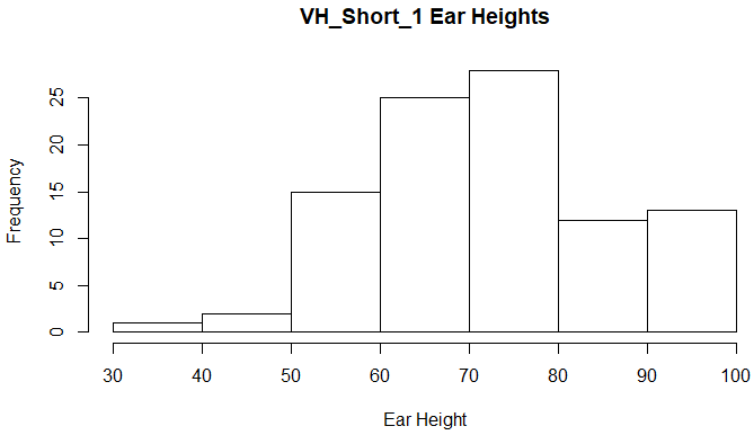

Gen_Short_2 Tillers
Frequency
0
20
40
60
80
0
2
4
6
8
10
12
Tillers

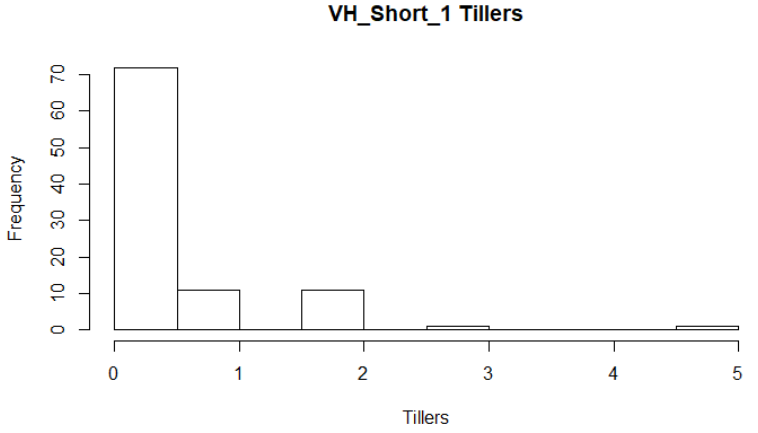

Gen_Short_2 Ear Position
Frequency
0
10
20
30
6
7
8
9
10
11
Ear Position

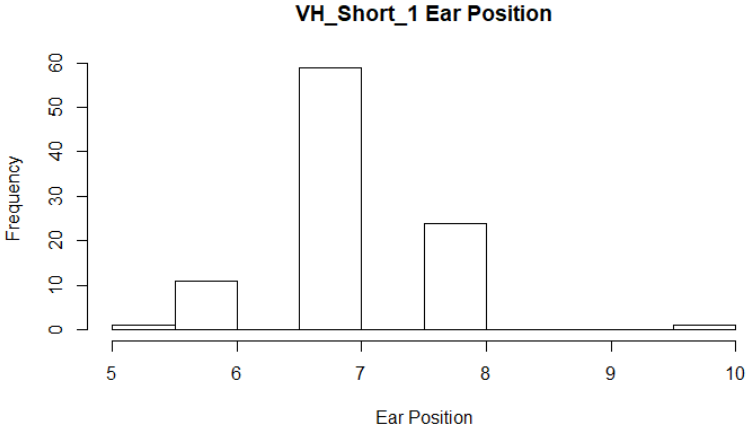

Gen_Short_2 Ear Number
Frequency
0
10
20
30
40
1
2
3
4
5
6
Ear Number

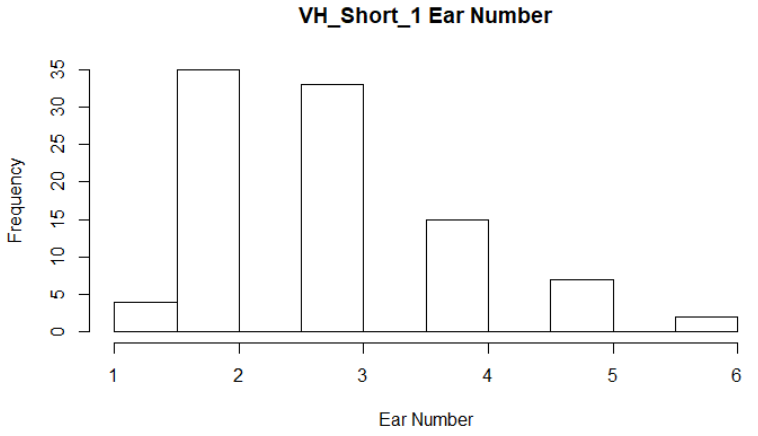

Gen_Short_2 Node Number
Frequency
0
5
10
15
20
11
12
13
14
15
16
17
18
Node Number

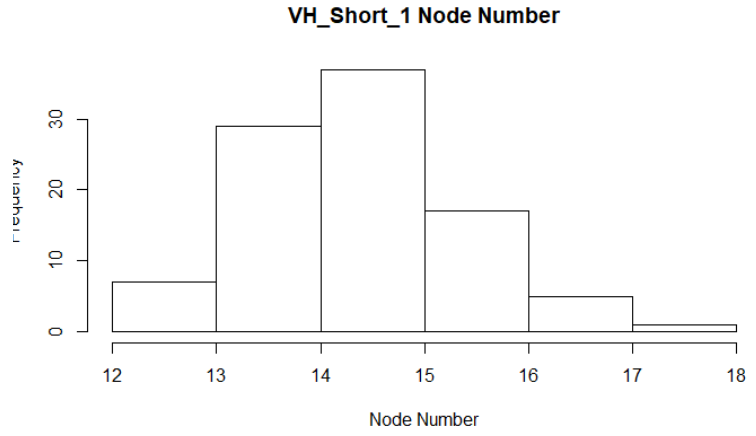

VH_Short_1 Plant Heights
Frequency
0
5
10
15
20
120
140
160
180
200
220
Plant Height

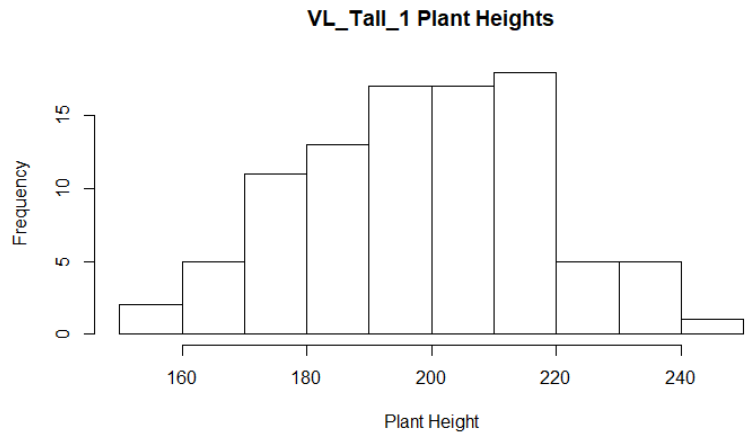

VH_Short_1 Ear Heights
Frequency
0
5
10
15
20
25
30
40
50
60
70
80
90
100
Ear Height

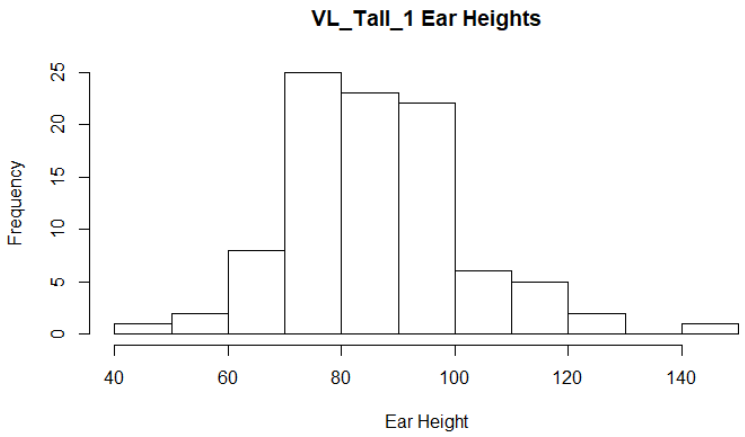

VH_Short_1 Tillers
Frequency
0
10
20
30
40
50
60
70
0
1
2
3
4
5
Tillers

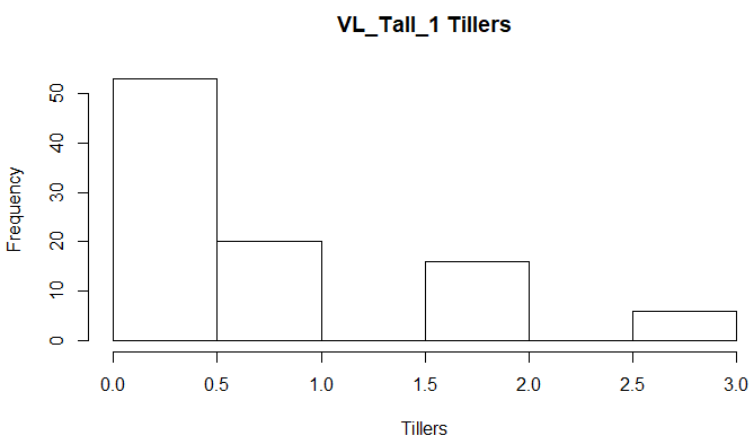

VH_Short_1 Ear Position
Frequency
0
10
20
30
40
50
60
5
6
7
8
9
10
Ear Position

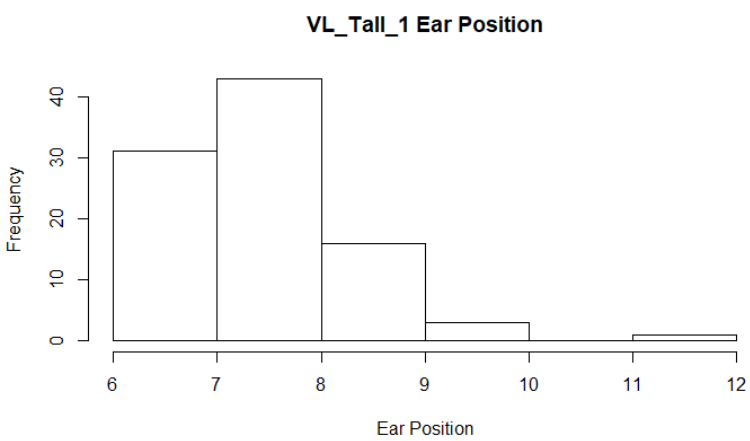

VH_Short_1 Ear Number
Frequency
0
5
10
15
20
25
30
35
1
2
3
4
5
6
Ear Number

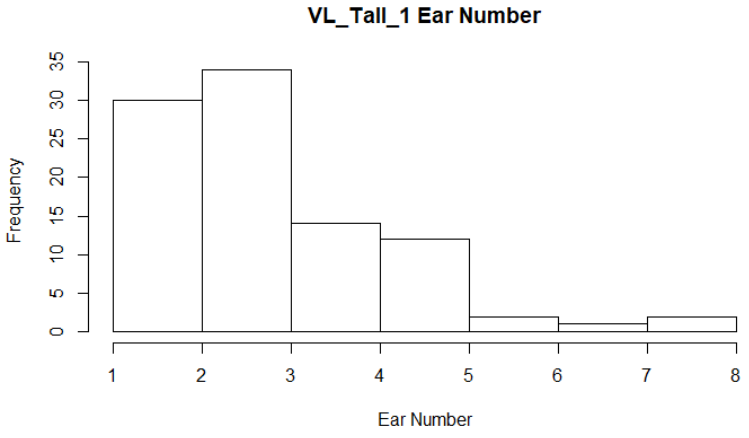

VH_Short_1 Node Number
0
10
20
30
12
13
14
15
16
17
18
Node Number

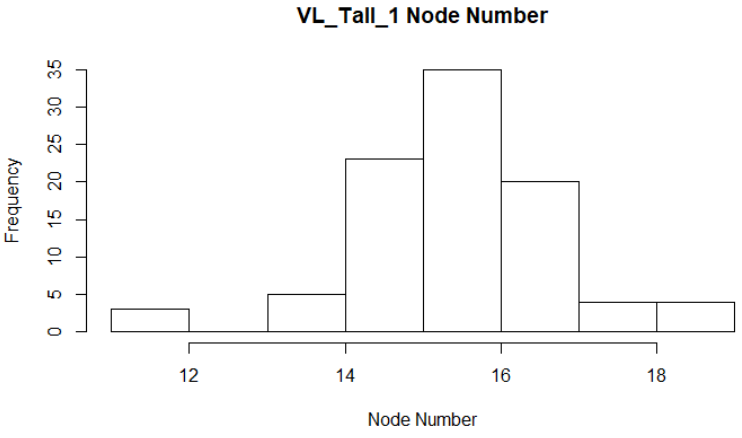

VL_Tall_1 Plant Heights
Frequency
0
5
10
15
160
180
200
220
240
Plant Height


VL_Tall_1 Ear Heights
Frequency
0
5
10
15
20
25
40
60
80
100
120
140
Ear Height


VL_Tall_1 Tillers
Frequency
0
10
20
30
40
50
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Tillers

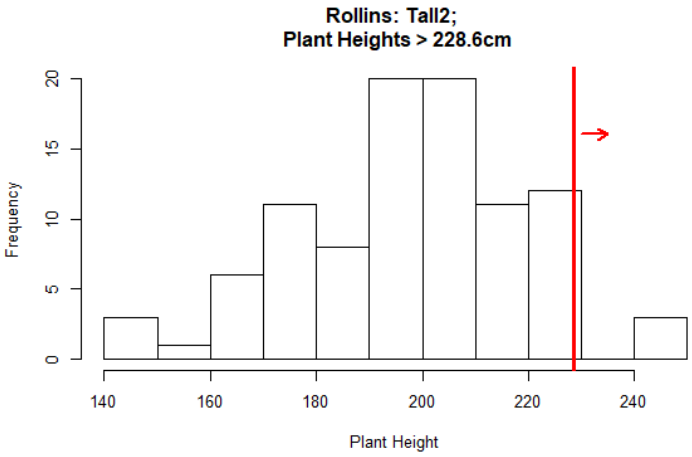

VL_Tall_1 Ear Position
Frequency
0
10
20
30
40
6
7
8
9
10
11
12
Ear Position

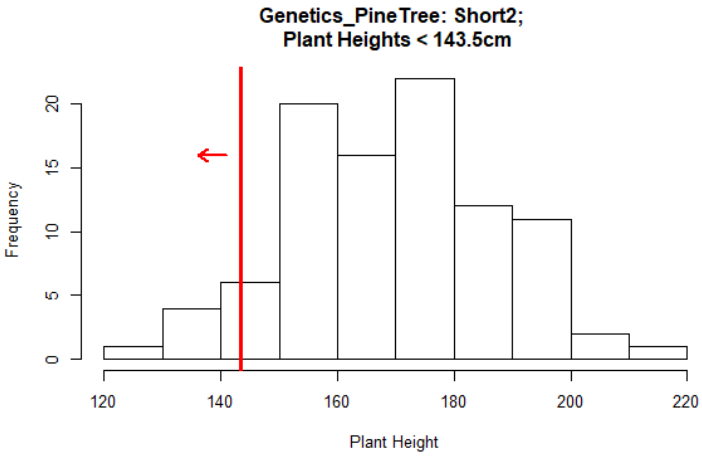

VL_Tall_1 Ear Number
Frequency
0
5
10
15
20
25
30
35
1
2
3
4
5
6
7
8
Ear Number

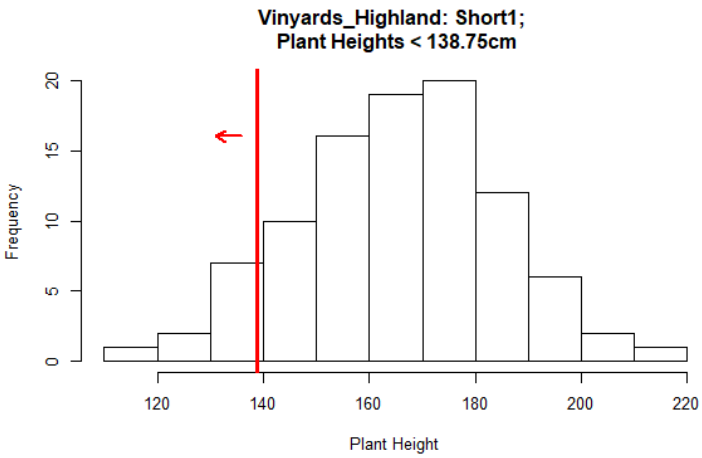

VL_Tall_1 Node Number
Frequency
0
5
10
15
20
25
30
35
12
14
16
18
Node Number

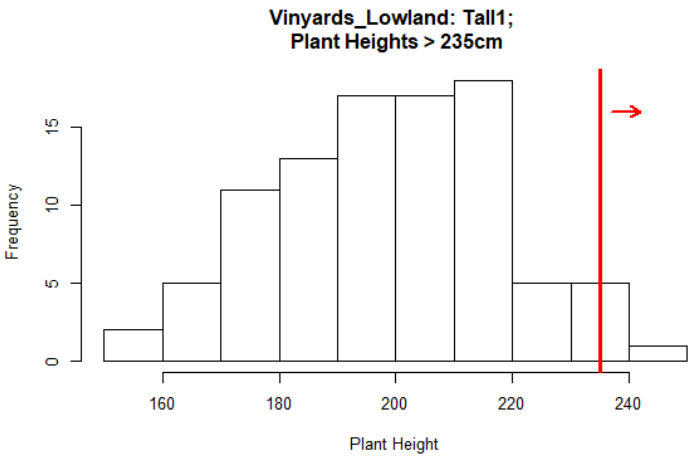
Determine truncation selection points. (These are the plant height criterial that females will have to be above or below to be harvested)

```
quantile(Roll_Tall_2$PlantHt,c(0.05, 0.95), na.rm=T)

   5%   95%
165.0 228.6

quantile(Gen_Short_2$PlantHt,c(0.05, 0.95), na.rm=T)

   5%   95%
143.5 200.0

quantile(VH_Short_1$PlantHt,c(0.05, 0.95), na.rm=T)

    5%    95%
138.75 200.00

quantile(VL_Tall_1$PlantHt,c(0.05, 0.95), na.rm=T)

 5% 95%
170 235


## Plant height truncation

hist(Roll_Tall_2$PlantHt, main="Rollins: Tall2; \n Plant Heights > 228.6cm",x
lab="Plant Height")
abline(v=quantile(Roll_Tall_2$PlantHt,c(0.95), na.rm=T), col="red", lwd=3)
arrows(230,16,235,16,length=0.1,col="red",lwd=2)


hist(Gen_Short_2$PlantHt, main="Genetics_PineTree: Short2; \n Plant Heights <
143.5cm",xlab="Plant Height")
abline(v=quantile(Gen_Short_2$PlantHt,c(0.05), na.rm=T), col="red", lwd=3)
arrows(141,16,136,16,length=0.1,col="red",lwd=2)

hist(VH_Short_1$PlantHt, main="Vinyards_Highland: Short1; \n Plant Heights <
138.75cm",xlab="Plant Height")
abline(v=quantile(VH_Short_1$PlantHt,c(0.05), na.rm=T), col="red", lwd=3)
arrows(136,16,131,16,length=0.1,col="red",lwd=2)

hist(VL_Tall_1$PlantHt, main="Vinyards_Lowland: Tall1; \n Plant Heights > 235
cm",xlab="Plant Height")
abline(v=quantile(VL_Tall_1$PlantHt,c(0.95), na.rm=T), col="red", lwd=3)
arrows(237,16,242,16,length=0.1,col="red",lwd=2)
```


Rollins: Tall2;
Plant Heights > 228.6cm
Frequency
0
5
10
15
20
140
160
180
200
220
240
Plant Height


Genetics_PineTree: Short2;
Plant Heights < 143.5cm
Frequency
0
5
10
15
20
120
140
160
180
200
220
Plant Height


Vinyards_Highland: Short1;
Plant Heights < 138.75cm
Frequency
0
5
10
15
20
120
140
160
180
200
220
Plant Height


Vinyards_Lowland: Tall1;
Plant Heights > 235cm
Frequency
0
5
10
15
160
180
200
220
240
Plant Height