

BuckVolExplr.R

Audrey McCombs

Sun Nov 27 19:25:17 2016

```
library(ggplot2)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##   filter, lag
```

```
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union
```

```
setwd("D:/Iowa State University/Debinski Lab/Nectar data/MAL")
```

```
buckvol15 <- read.csv("nectar analysis/data files/buckvol15.csv", header = T)
buckvol16 <- read.csv("nectar analysis/data files/buckvol16.csv", header = T)
buckvolboth <- rbind(buckvol15,buckvol16)
```

#Data summaries

```
summary(buckvol15)
```

```
##           date           plot  treatment      quad      volume
## 2015-06-22: 48  WSR10   : 52  C:233    WSR10NE: 15  Min.    :0.01562
## 2015-06-23: 46  WH12   : 46  H:227    EC3NE   : 13  1st Qu.:0.21818
## 2015-06-21: 39  EH4     : 44           WHSR9SW: 13  Median :0.36364
## 2015-06-24: 39  WHSR9   : 44           WSR10NW: 13  Mean   :0.45599
## 2015-06-30: 36  EC3     : 43           EC3SW   : 12  3rd Qu.:0.54545
## 2015-06-20: 35  CH5     : 40           EHSR1SE: 12  Max.   :3.03125
## (Other)      :217  (Other):191           (Other):382
```

```
summary(buckvol16)
```

```
##           date           plot  treatment      quad      volume
## 2016-06-23:65  WSR10   : 51  C:190    EHSR1SW: 14  Min.    :0.01515
## 2016-06-24:70  WHSR9   : 45  H:186    WSR10NW: 14  1st Qu.:0.04545
## 2016-06-25:58  WH12   : 43           WSR10SE: 14  Median :0.07576
## 2016-06-26:52  CC6     : 40           WSR10NE: 13  Mean   :0.08464
## 2016-06-27:56  CH5     : 30           CC6NW   : 12  3rd Qu.:0.10985
## 2016-06-29:53  CSR7    : 30           CSR7SW  : 12  Max.   :0.43939
## 2016-06-30:22  (Other) :137           (Other):297
```

```
summary(buckvolboth)
```

```
##           date      plot  treatment      quad      volume
## 2016-06-24: 70   WSR10  :103   C:423    WSR10NE: 28   Min.    :0.01515
## 2016-06-23: 65   WH12   : 89   H:413    WSR10NW: 27   1st Qu.:0.07576
## 2016-06-25: 58   WHSR9   : 89           WSR10SE: 26   Median  :0.16364
## 2016-06-27: 56   CC6     : 76           WH12SE : 24   Mean    :0.28897
## 2016-06-29: 53   CH5     : 70           EHSR1SW: 23   3rd Qu.:0.38182
## 2016-06-26: 52   EH4     : 69           ESR2NE : 23   Max.    :3.03125
## (Other)      :482   (Other):340           (Other):685
```

```
summarize(group_by(buckvol15, treatment), meanVol = mean(volume), sdVolume = sd(volume))
```

```
## Source: local data frame [2 x 3]
##
##   treatment  meanVol  sdVolume
##   (fctr)      (dbl)    (dbl)
## 1          C 0.5409932 0.4484135
## 2          H 0.3687381 0.3186429
```

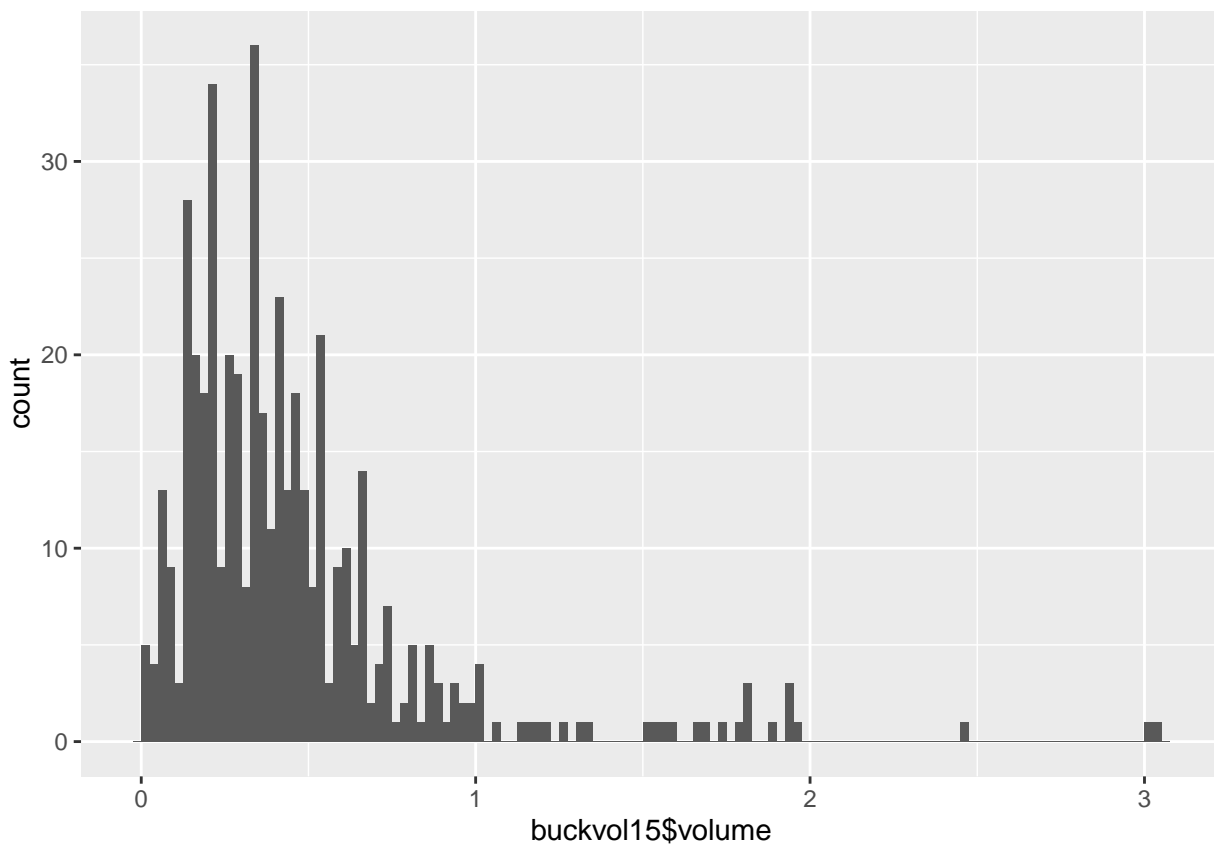
```
summarize(group_by(buckvol16, treatment), meanVol = mean(volume), sdVolume = sd(volume))
```

```
## Source: local data frame [2 x 3]
##
##   treatment  meanVol  sdVolume
##   (fctr)      (dbl)    (dbl)
## 1          C 0.08847687 0.06126738
## 2          H 0.08072662 0.04864575
```

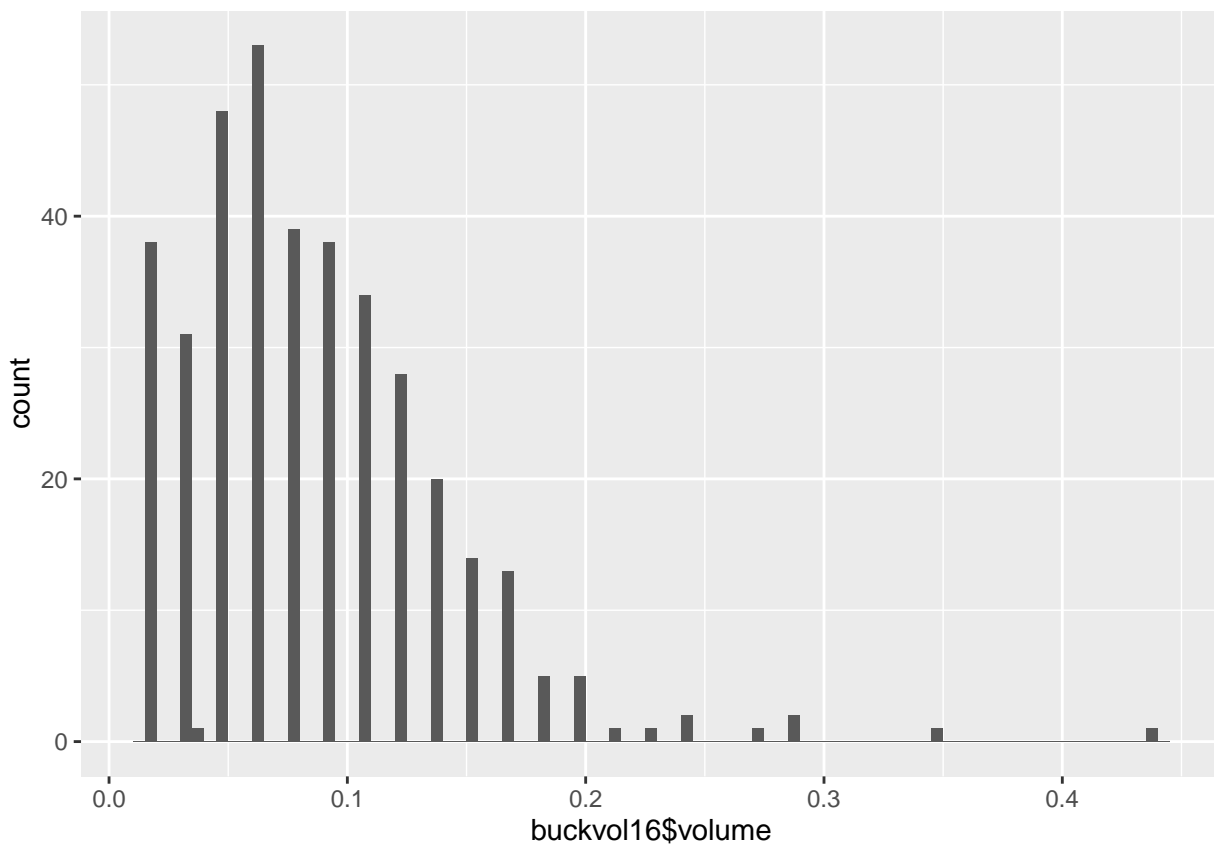
```
summarize(group_by(buckvolboth, treatment), meanVol = mean(volume), sdVolume = sd(volume))
```

```
## Source: local data frame [2 x 3]
##
##   treatment  meanVol  sdVolume
##   (fctr)      (dbl)    (dbl)
## 1          C 0.3377353 0.4037430
## 2          H 0.2390283 0.2781028
```

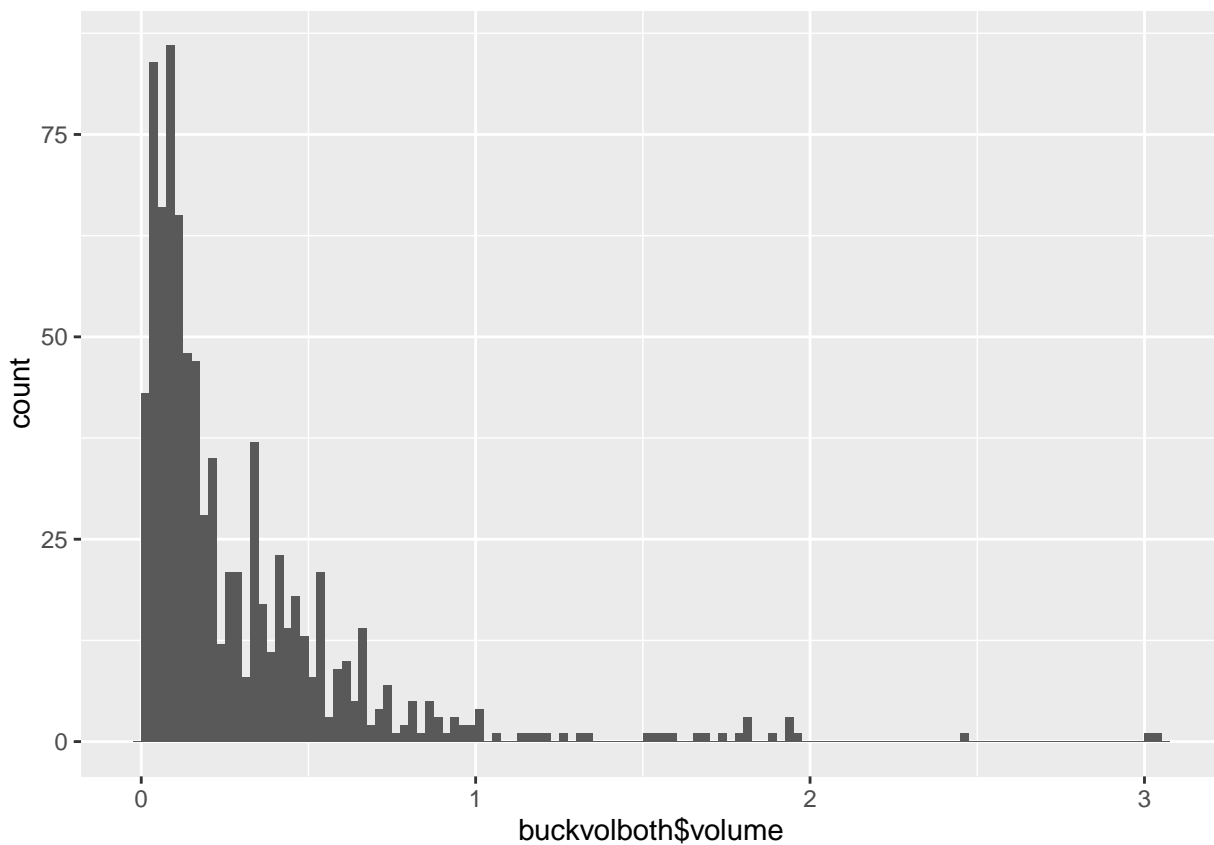
```
qplot(buckvol15$volume, binwidth = .025)
```



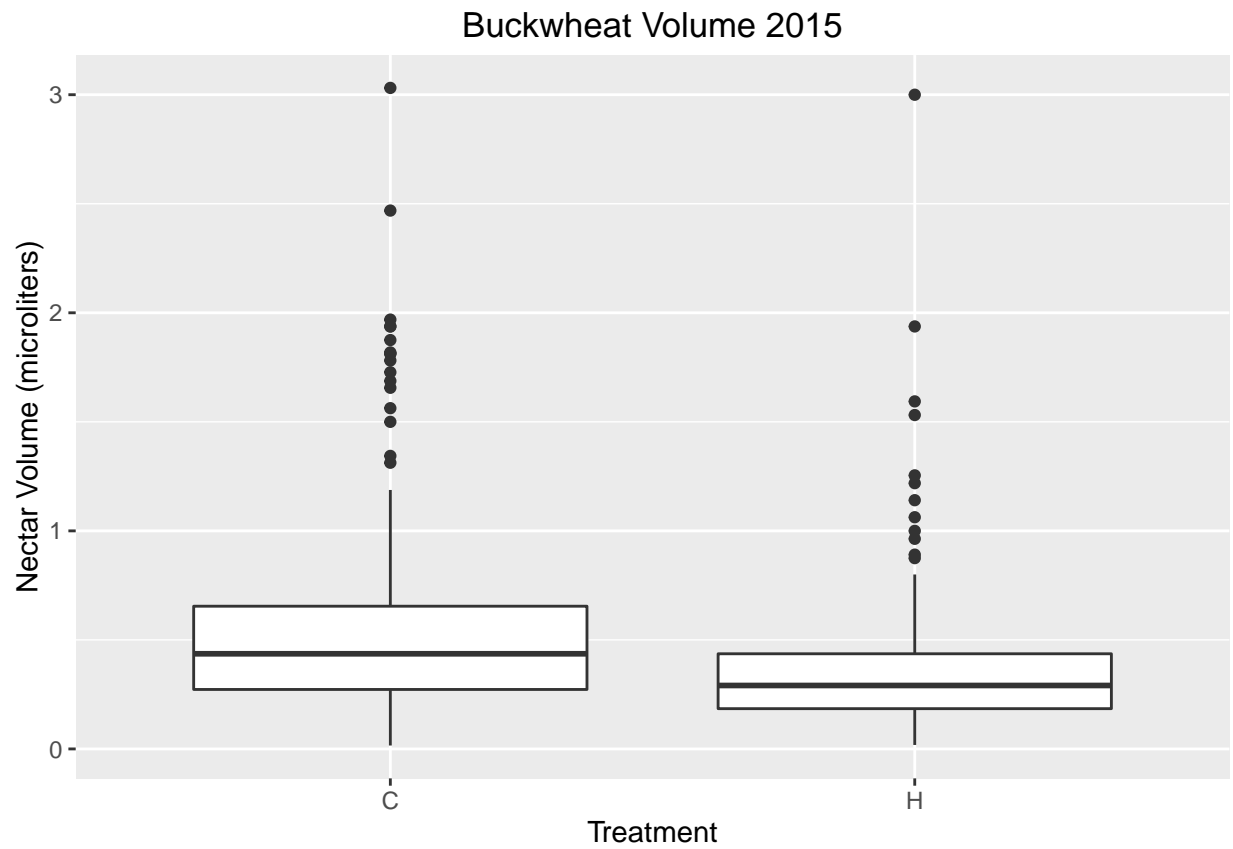
```
qplot(buckvol16$volume, binwidth = .005)
```



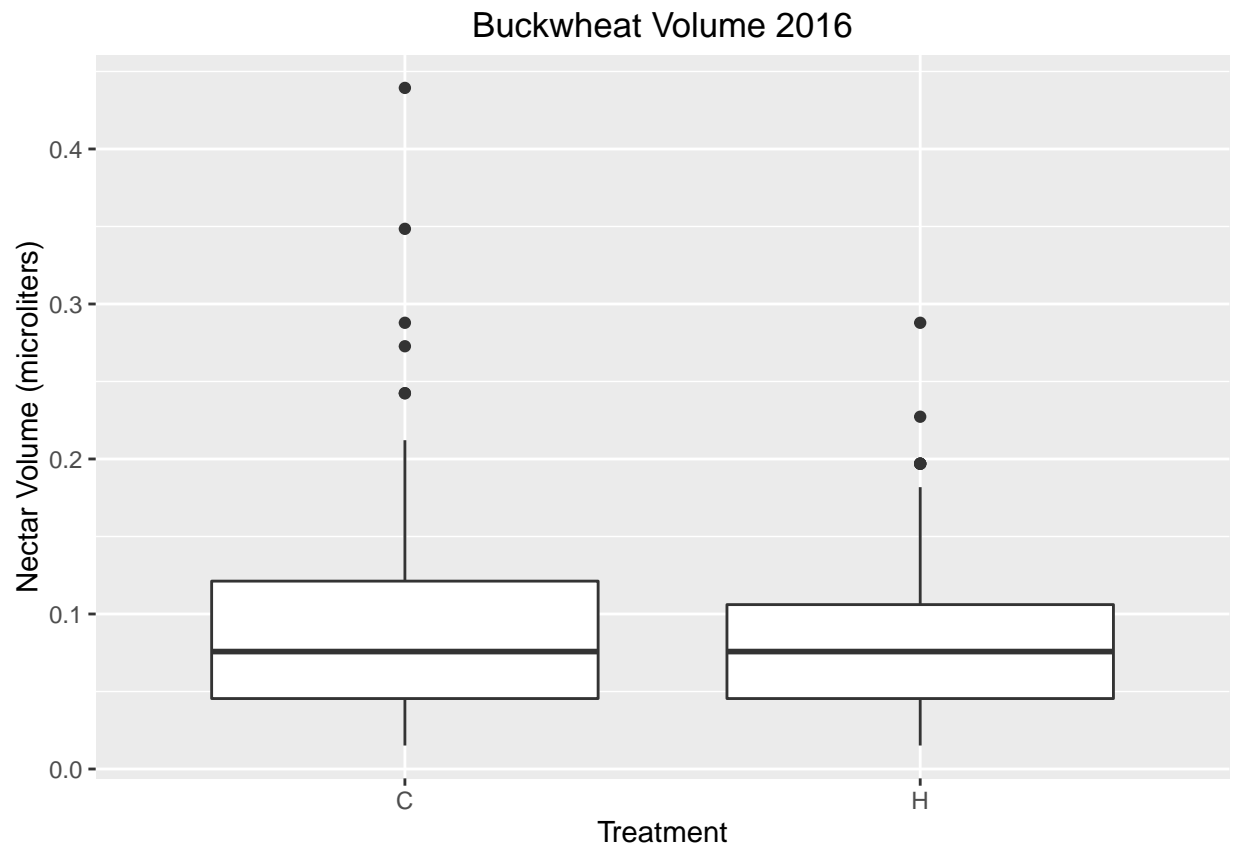
```
qplot(buckvolboth$volume, binwidth = .025)
```



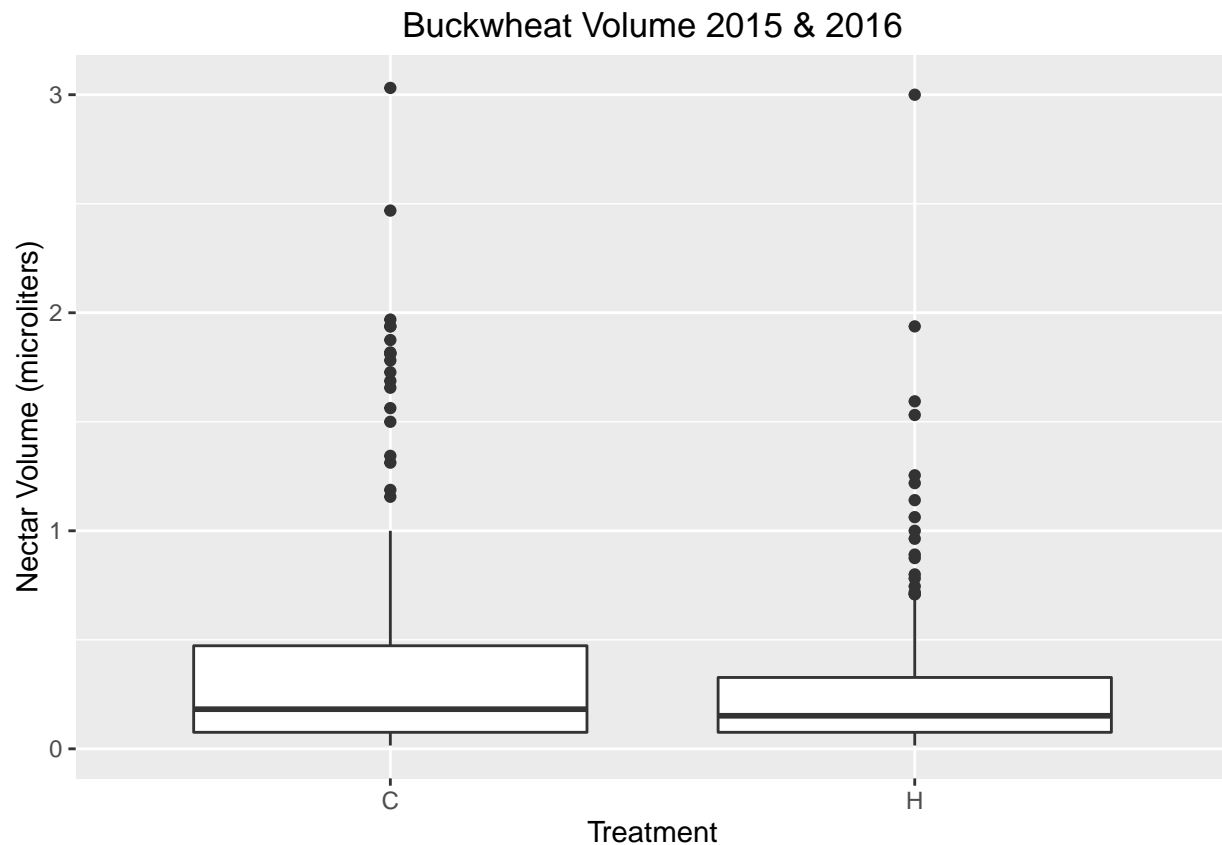
```
ggplot(buckvol15, aes(x=treatment, y=volume)) + geom_boxplot() +  
  xlab("Treatment") +  
  ylab("Nectar Volume (microliters)") + ggtitle("Buckwheat Volume 2015")
```



```
ggplot(buckvol16, aes(x=treatment, y=volume)) + geom_boxplot() +  
  xlab("Treatment") +  
  ylab("Nectar Volume (microliters)") + ggtitle("Buckwheat Volume 2016")
```



```
ggplot(buckvolboth, aes(x=treatment, y=volume)) + geom_boxplot() +  
  xlab("Treatment") +  
  ylab("Nectar Volume (microliters)") + ggtitle("Buckwheat Volume 2015 & 2016")
```



Homoscedastic?

```
var15C <- sd(buckvol15$volume[buckvol15$treatment=="C"])^2
var15H <- sd(buckvol15$volume[buckvol15$treatment=="H"])^2
ratio15 <- var15C/var15H
ratio15
```

```
## [1] 1.980381
```

```
var16C <- sd(buckvol16$volume[buckvol16$treatment=="C"])^2
var16H <- sd(buckvol16$volume[buckvol16$treatment=="H"])^2
ratio16 <- var16C/var16H
ratio16
```

```
## [1] 1.586239
```

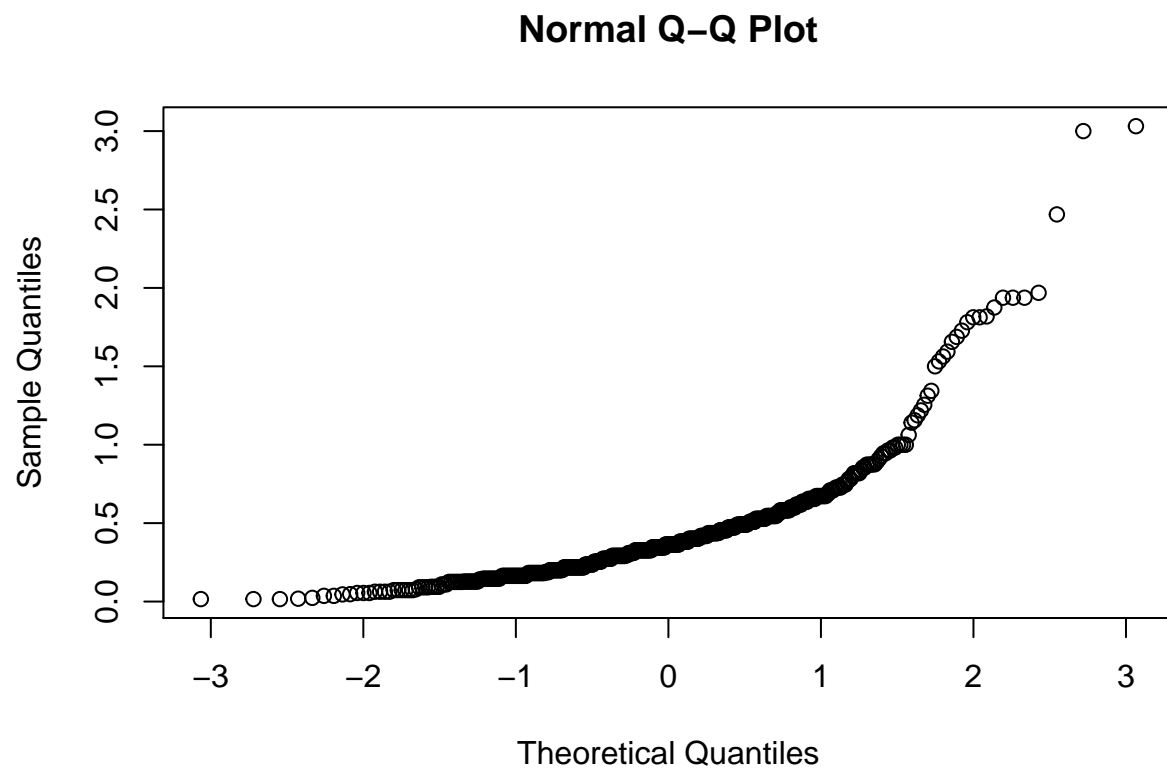
```
varbothC <- sd(buckvolboth$volume[buckvolboth$treatment=="C"])^2
varbothH <- sd(buckvolboth$volume[buckvolboth$treatment=="H"])^2
ratioboth <- varbothC/varbothH
ratioboth
```

```
## [1] 2.107654
```



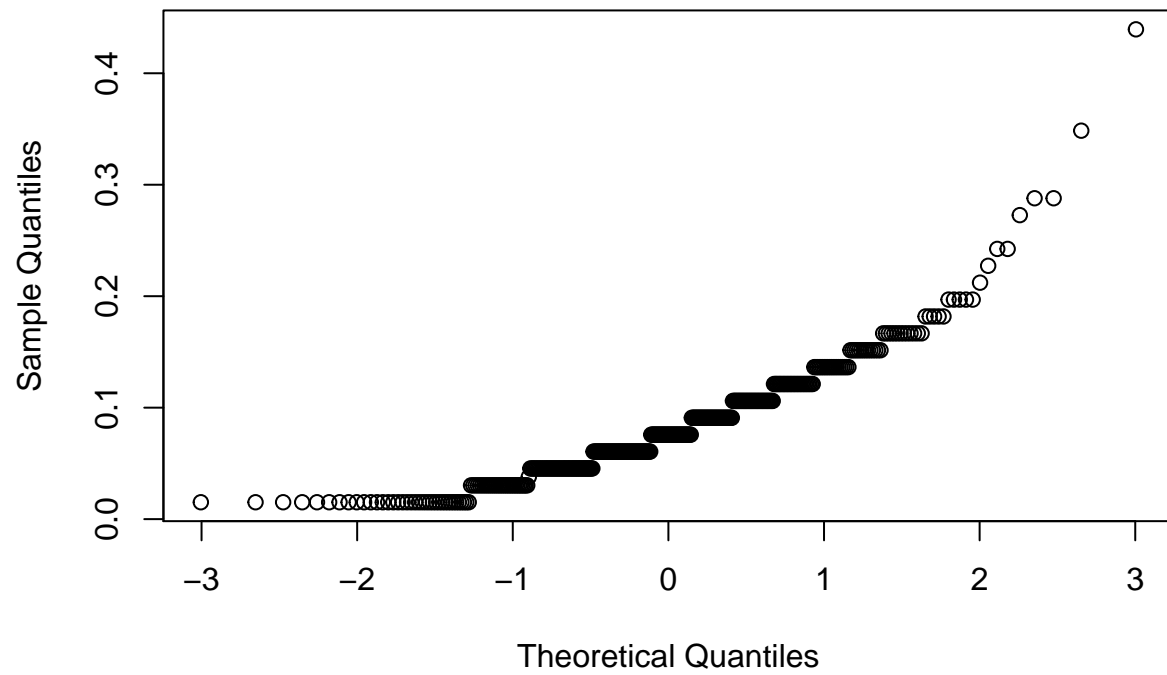
```
# Q-Q plots
```

```
qqnorm(buckvol15$volume)
```



```
qqnorm(buckvol16$volume)
```

Normal Q-Q Plot



```
qqnorm(buckvolboth$volume)
```

Normal Q-Q Plot

