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2021-05-19

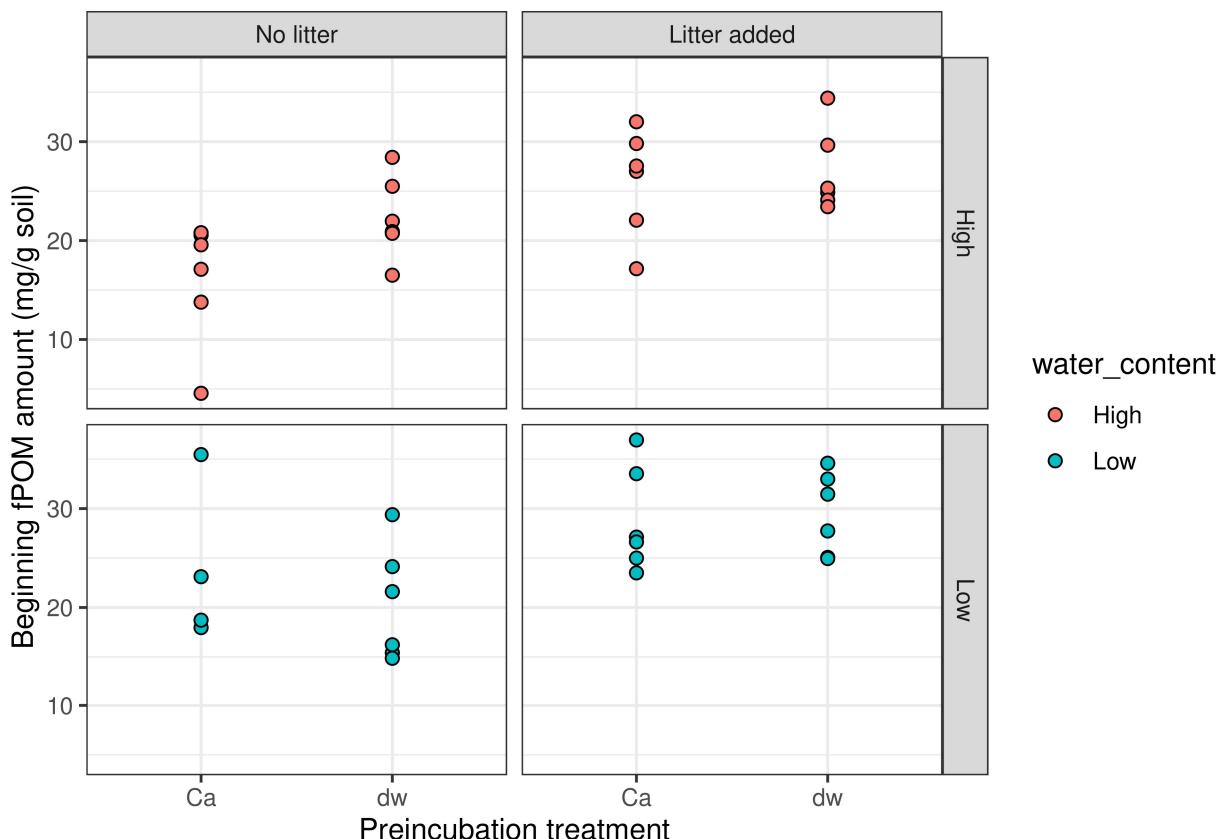
Contents

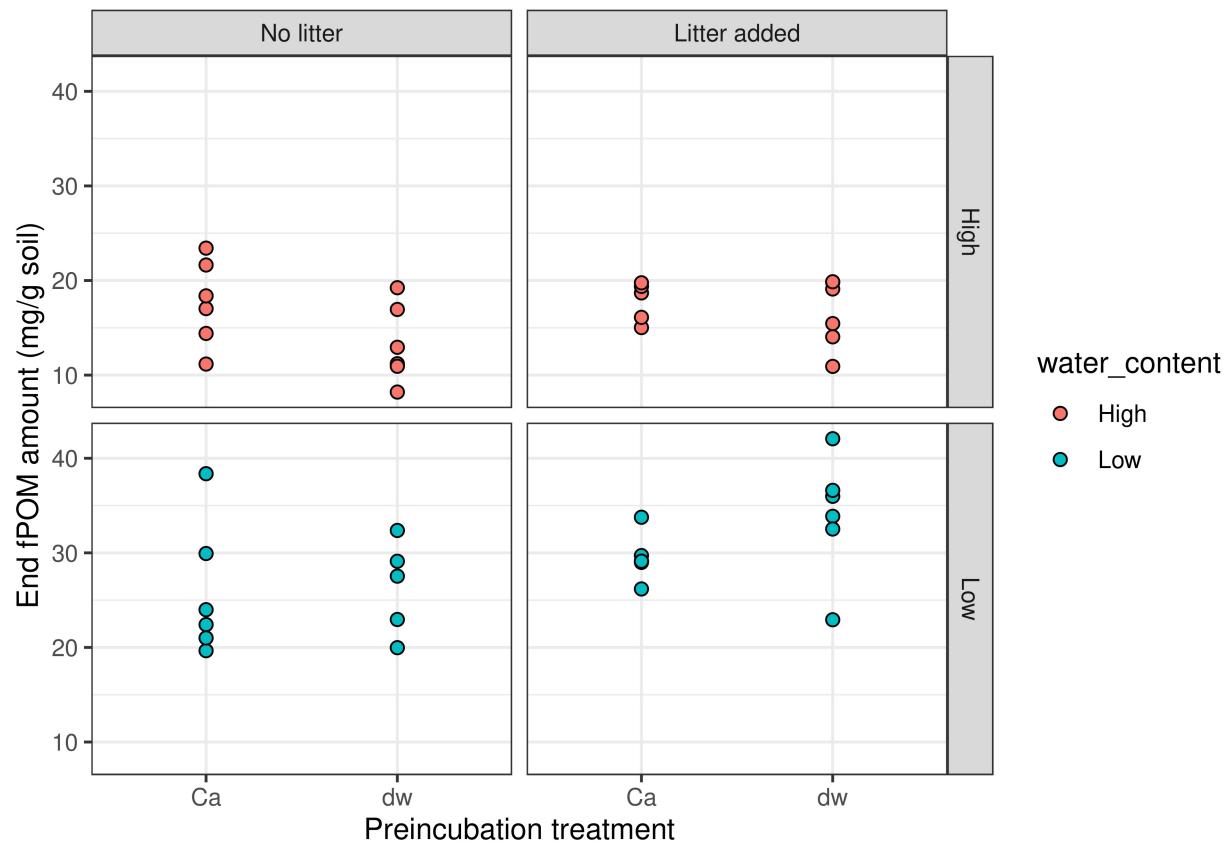
POM fraction amounts 1

POM fraction amounts

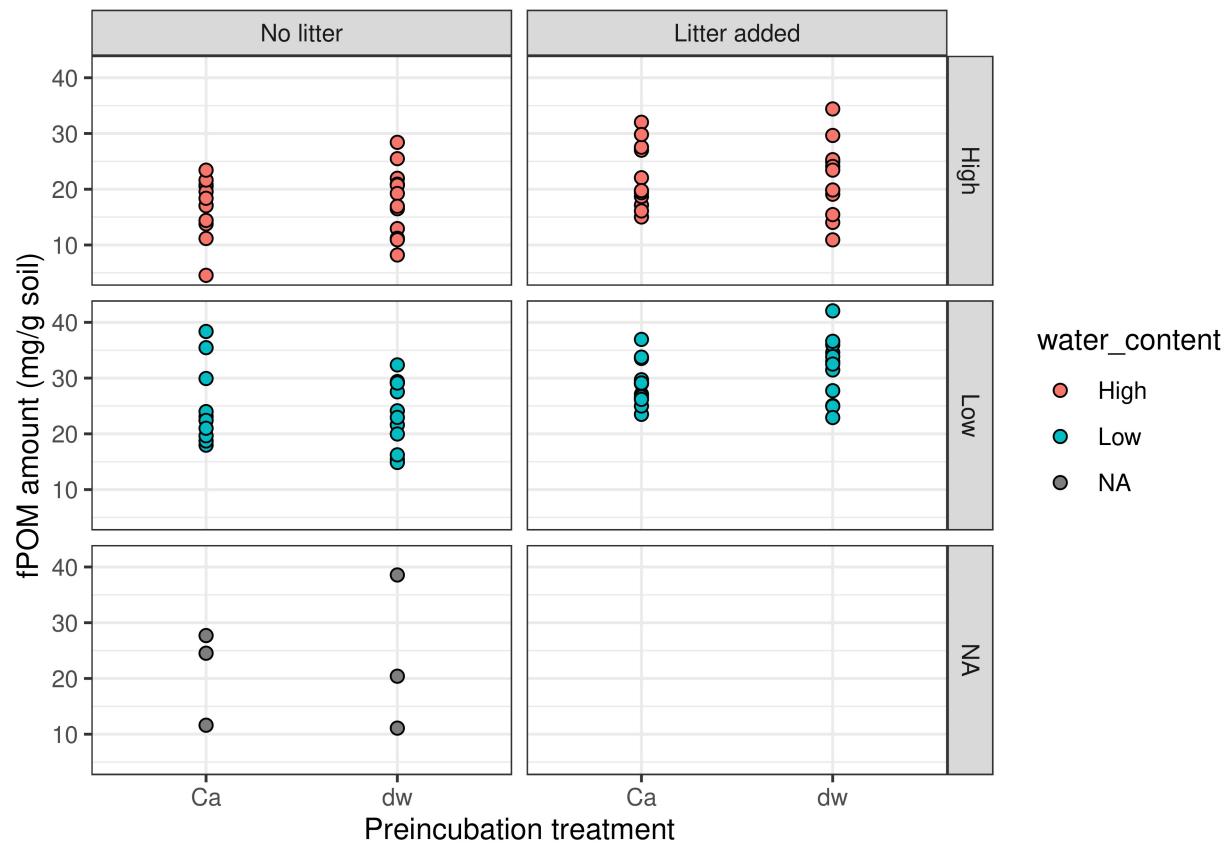
fPOM amounts

Warning: Removed 1 rows containing missing values (geom_point).



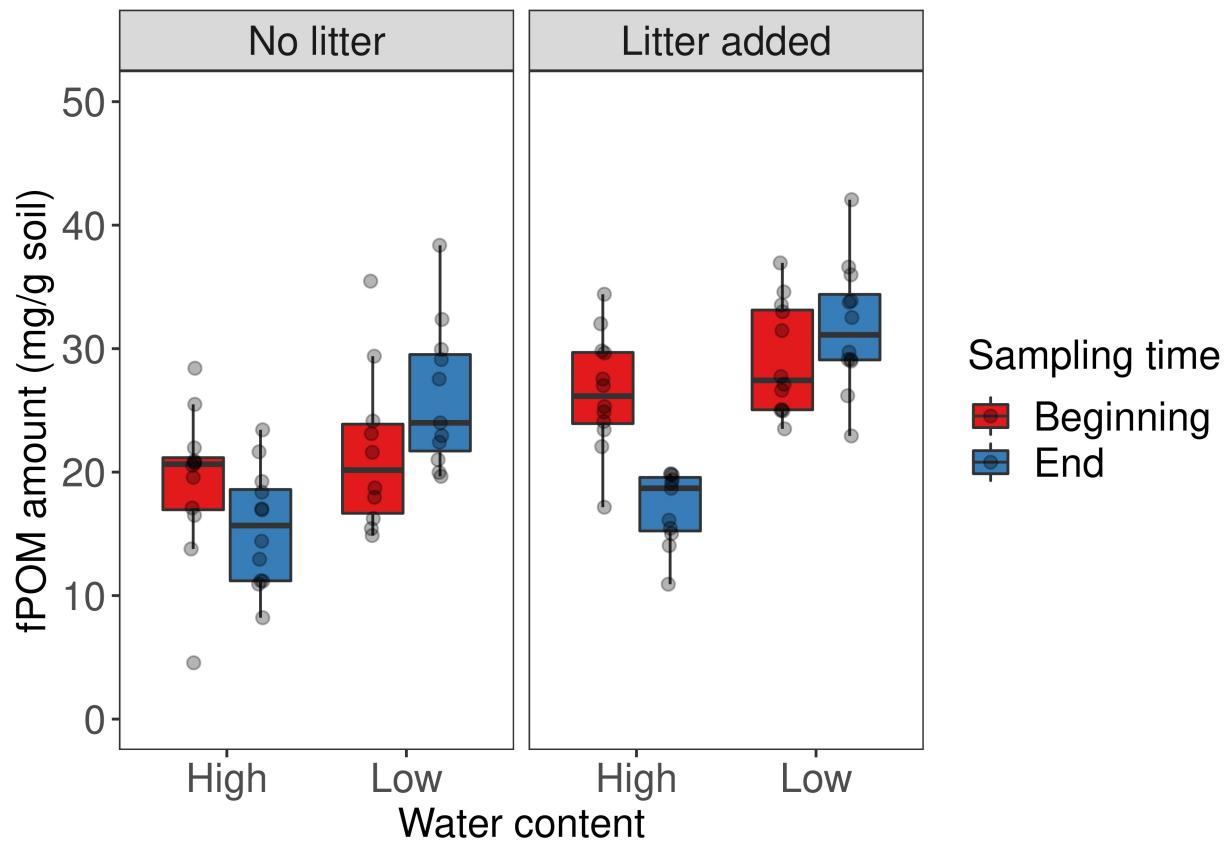


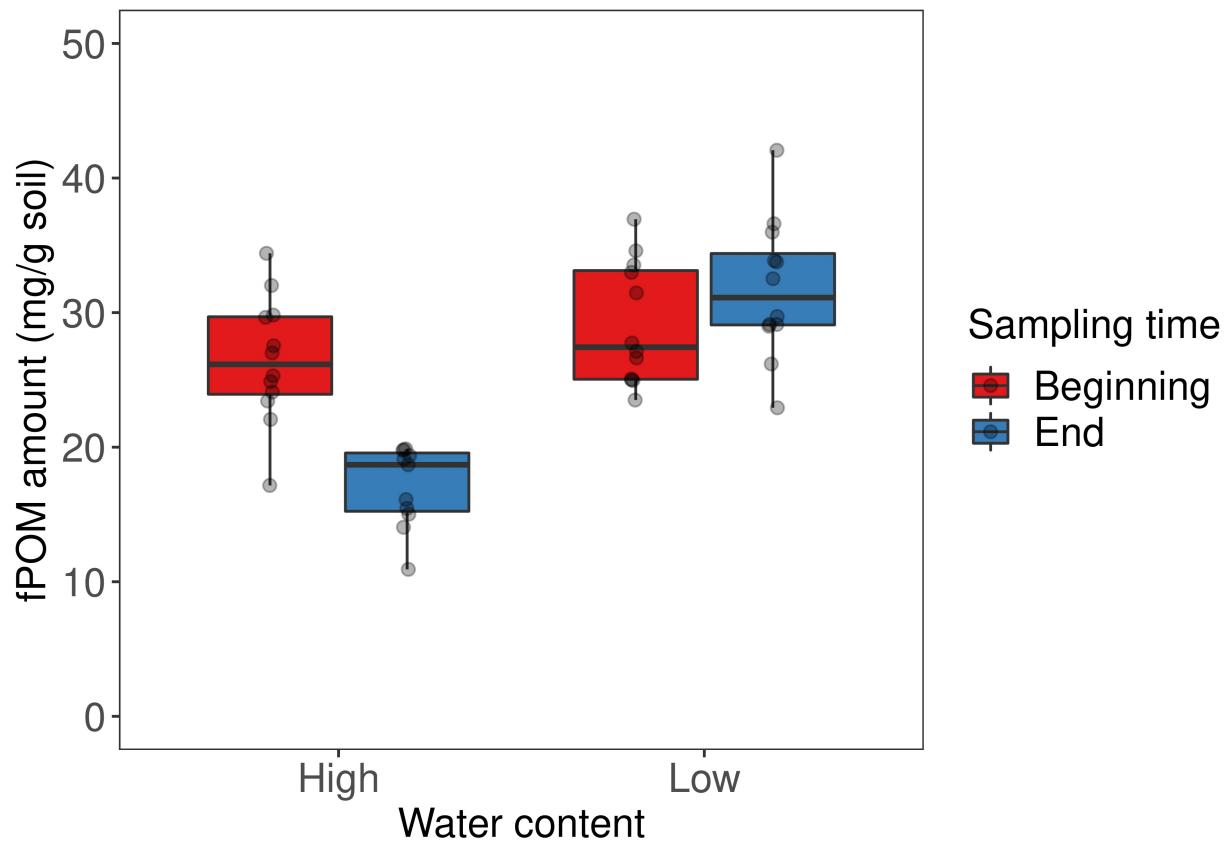
```
## Warning: Removed 1 rows containing missing values (geom_point).
```



```
## Warning: Removed 1 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```





```
##                                     Df Sum Sq Mean Sq F value    Pr(>F)
## sampling_point                  1   56.8   56.8   1.641 0.203612
## water_content                   1 1423.0 1423.0 41.079 7.03e-09 ***
## sampling_point:water_content   1  560.4  560.4 16.178 0.000122 ***
## Residuals                      88 3048.3   34.6
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 1 observation deleted due to missingness
```

term	df	sumsq	meansq	statistic	p.value
sampling_point	1	56.8294	56.8294	1.6406	0.2036
water_content	1	1422.9797	1422.9797	41.0791	0.0000
sampling_point:water_content	1	560.4098	560.4098	16.1781	0.0001
Residuals	88	3048.3204	34.6400	NA	NA

```
##                                     Df Sum Sq Mean Sq F value    Pr(>F)
## water_content                   1   98.3   98.3   3.278  0.0774 .
## litter                          1  616.7  616.7 20.565 4.75e-05 ***
## water_content:litter            1     0.1     0.1   0.003  0.9544
## Residuals                      42 1259.4   30.0
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 1 observation deleted due to missingness
```

```
##                                     Df Sum Sq Mean Sq F value    Pr(>F)
```

```

## water_content      1 1885.1 1885.1 81.169 2.3e-11 ***
## litter             1 151.5 151.5  6.521  0.0144 *
## water_content:litter 1 45.3 45.3  1.950  0.1700
## Residuals         42 975.4 23.2
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = fPOM_dry_mg_g ~ sampling_point * water_content, data = filter(df, sampling_point
## 
## $sampling_point
##          diff      lwr      upr   p adj
## End-Beginning -1.571892 -4.010748 0.866965 0.2036125
## 
## $water_content
##          diff      lwr      upr   p adj
## Low-High 7.865664 5.426231 10.3051     0
## 
## $`sampling_point:water_content`
##          diff      lwr      upr   p adj
## End:High-Beginning:High -6.573998 -11.071508 -2.076489 0.0013581
## Beginning:Low-Beginning:High 2.926219 -1.623187 7.475625 0.3379977
## End:Low-Beginning:High 6.229207 1.731698 10.726717 0.0026594
## Beginning:Low-End:High 9.500218 4.903755 14.096680 0.0000031
## End:Low-End:High 12.803206 8.258102 17.348309 0.0000000
## End:Low-Beginning:Low 3.302988 -1.293474 7.899451 0.2432830

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = fPOM_dry_mg_g ~ water_content * litter, data = df_end)
## 
## $water_content
##          diff      lwr      upr   p adj
## Low-High 12.80321 9.935318 15.67109     0
## 
## $litter
##          diff      lwr      upr   p adj
## Litter added-No litter 3.625621 0.757733 6.493509 0.0144636
## 
## $`water_content:litter`
##          diff      lwr      upr   p adj
## Low>No litter-High>No litter 10.659071 5.278032 16.040110 0.0000233
## High:Litter added-High>No litter 1.646287 -3.734752 7.027326 0.8454454
## Low:Litter added-High>No litter 16.277759 11.014999 21.540519 0.0000000
## High:Litter added-Low>No litter -9.012784 -14.509557 -3.516011 0.0004278
## Low:Litter added-Low>No litter 5.618688 0.237649 10.999727 0.0377459
## Low:Litter added-High:Litter added 14.631472 9.250433 20.012511 0.0000000

## Tukey multiple comparisons of means
## 95% family-wise confidence level

```

```

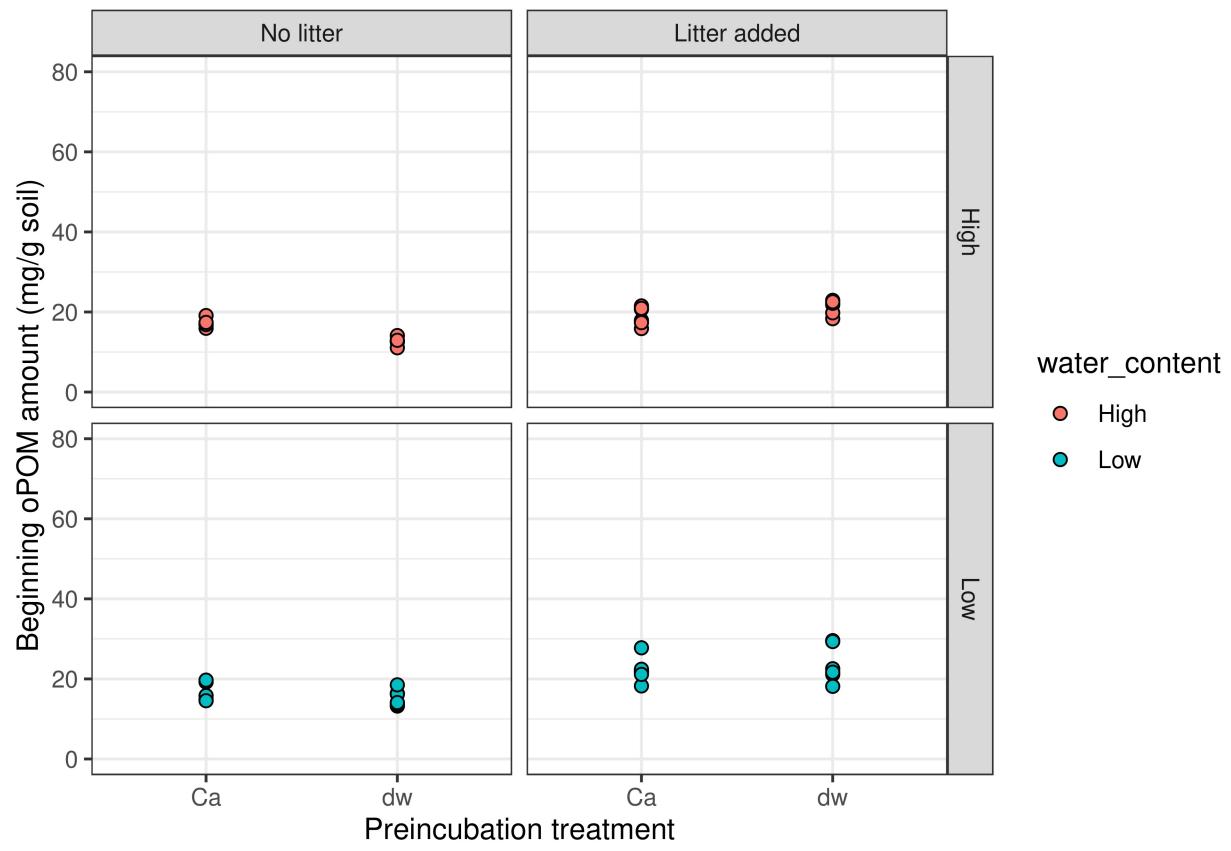
## 
## Fit: aov(formula = fPOM_dry_mg_g ~ water_content * litter, data = df_beg)
## 
## $water_content
##          diff      lwr      upr     p adj
## Low-High 2.926219 -0.3355921 6.18803 0.0773838
## 
## $litter
##          diff      lwr      upr     p adj
## Litter added-No litter 7.322063 4.060252 10.58387 4.82e-05
## 
## $`water_content:litter`
##          diff      lwr      upr     p adj
## Low:No litter-High:No litter 2.495017 -3.776833 8.766867 0.7129228
## High:Litter added-High:No litter 7.248412  1.268438 13.228387 0.0119879
## Low:Litter added-High:No litter 9.929932  3.949957 15.909906 0.0003596
## High:Litter added-Low:No litter 4.753395 -1.518455 11.025245 0.1943781
## Low:Litter added-Low:No litter 7.434915  1.163064 13.706765 0.0144923
## Low:Litter added-High:Litter added 2.681520 -3.298455 8.661494 0.6305713

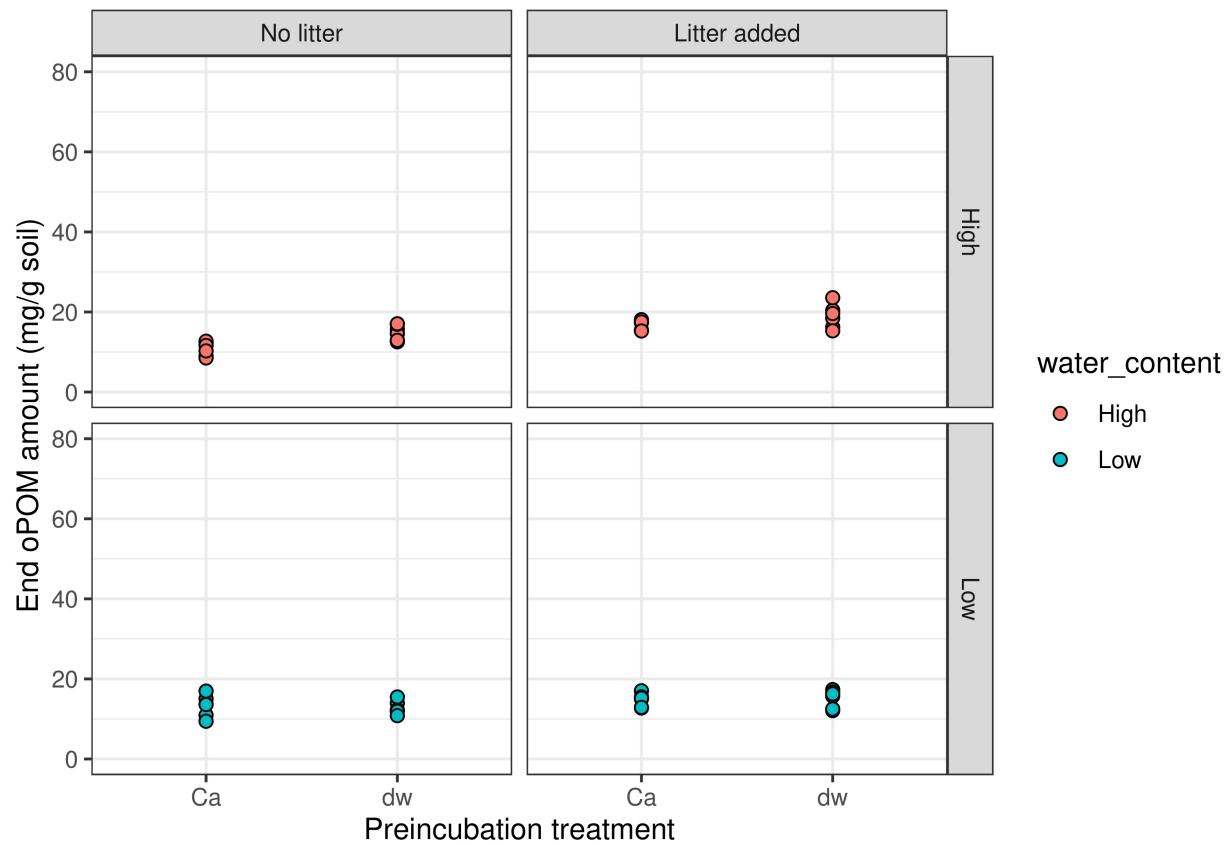
```

Ca treatment does not affect fPOM in any water content/litter treatnebt combination fPOM decreases from beginnng to end of incubation at high water content This result fits delta13C-CO₂ data that shows higher delta values at higher water content. fPOM somewhat increases at low water content - does low water content induce translocation of POM from occluded to free?? Isotope ratio can help identify pathway.

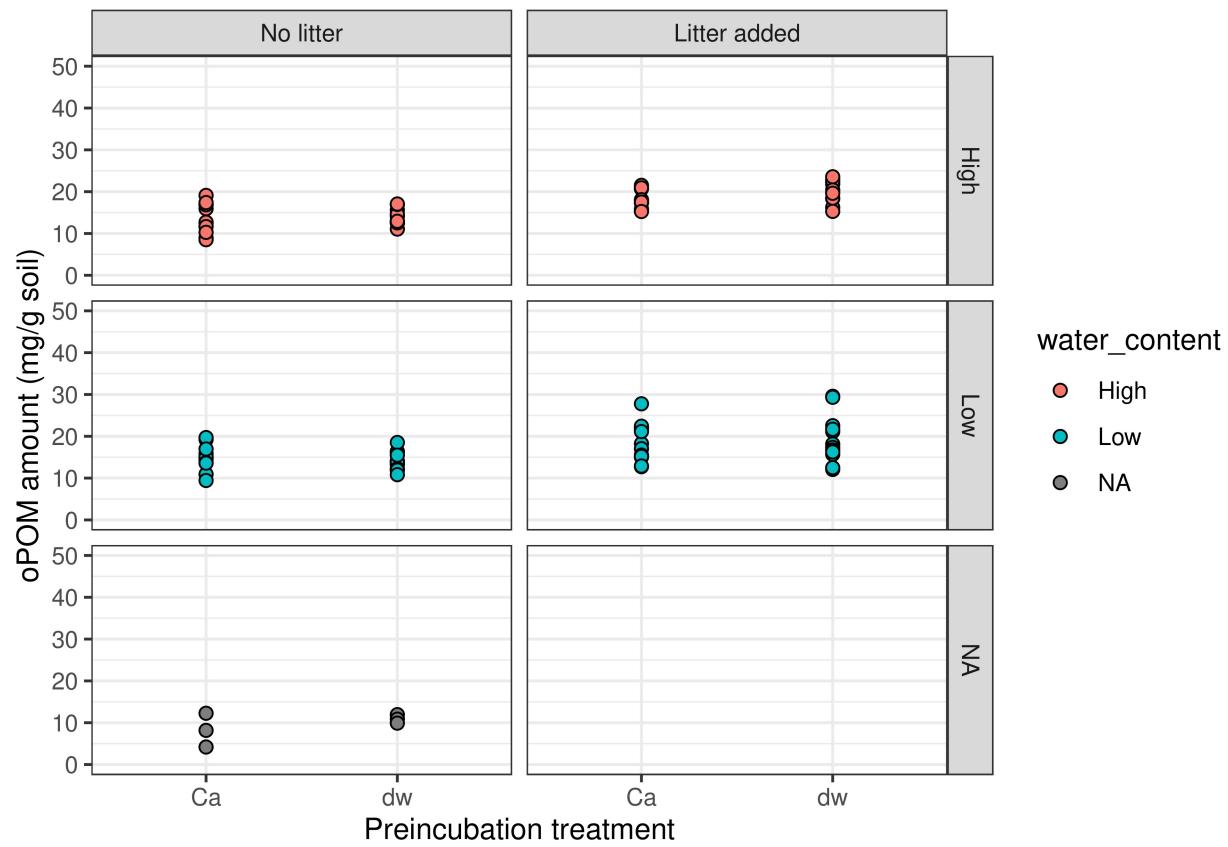
oPOM amounts

```
## Warning: Removed 1 rows containing missing values (geom_point).
```



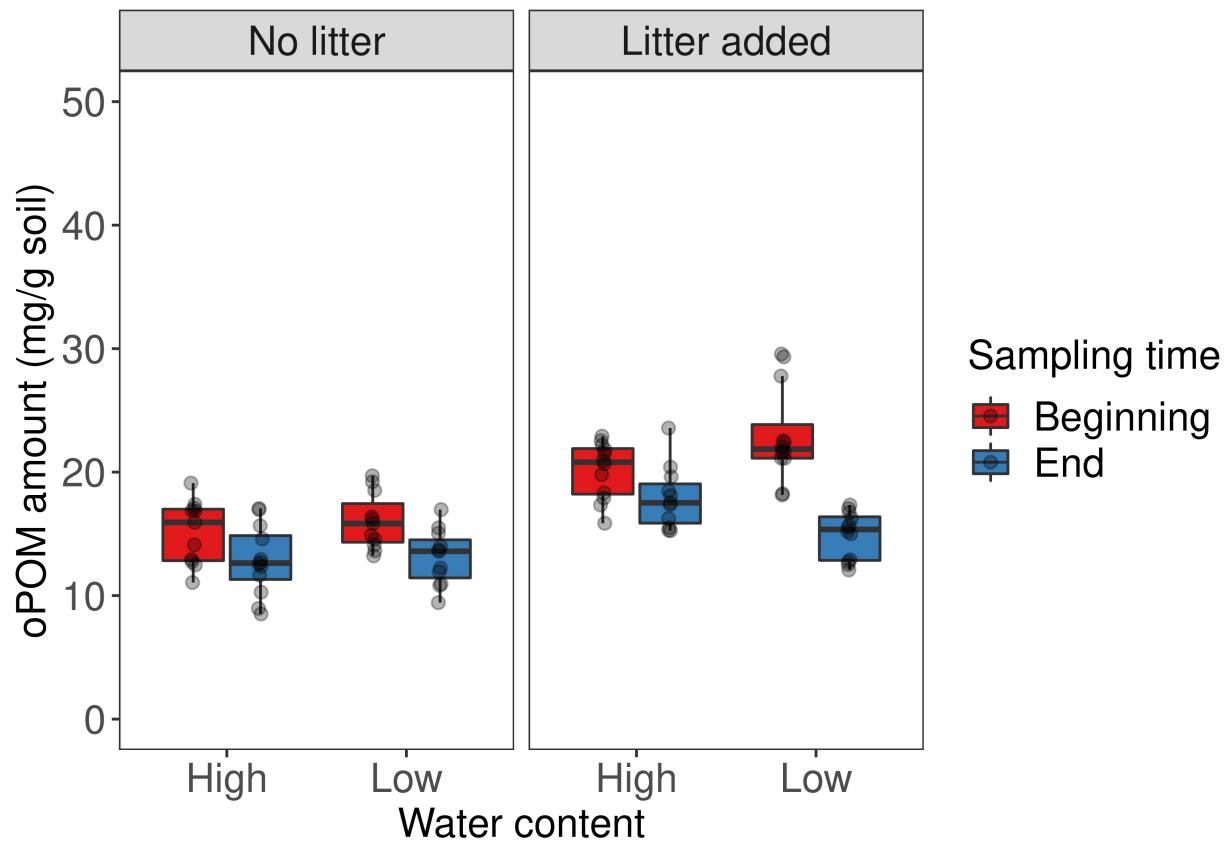


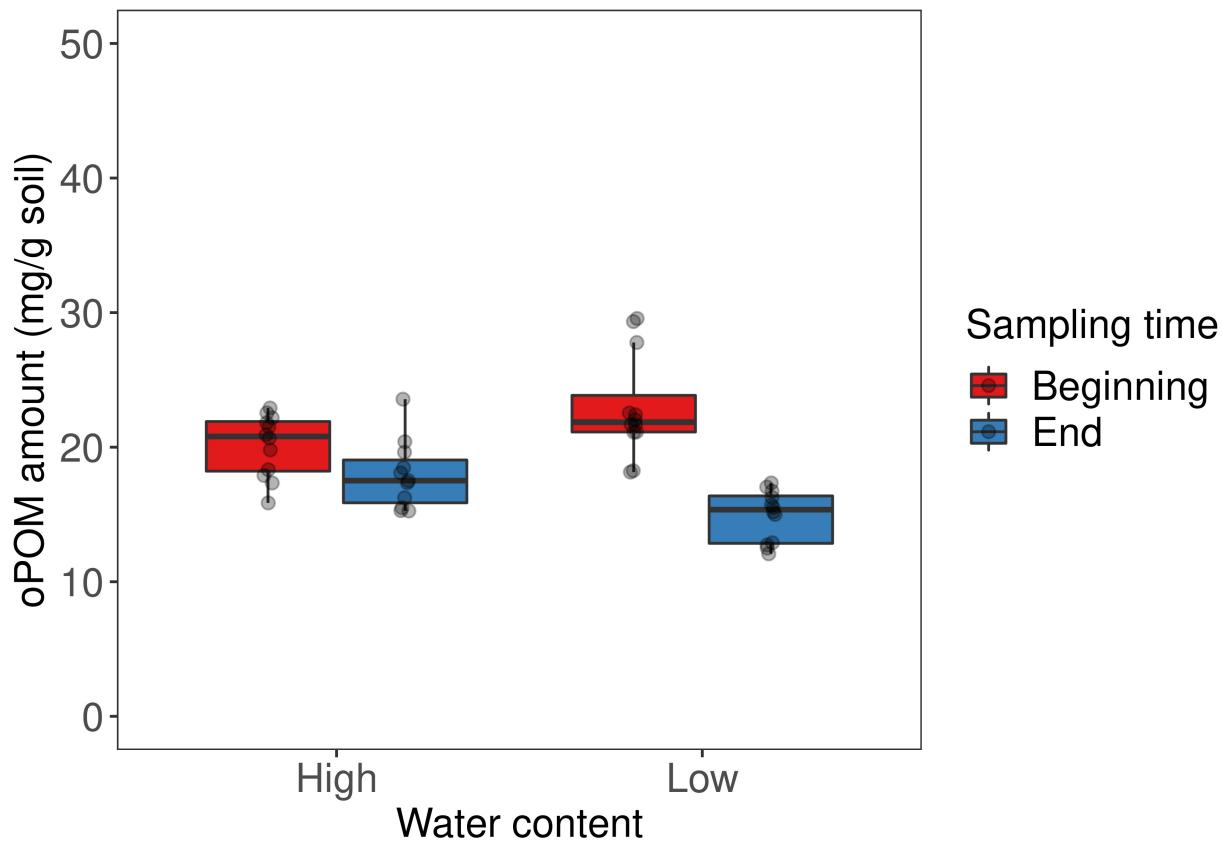
```
## Warning: Removed 1 rows containing missing values (geom_point).
```



```
## Warning: Removed 1 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```





```

##                               Df Sum Sq Mean Sq F value    Pr(>F)
## water_content              1   2.5    2.5   0.185   0.6680
## sampling_point             1 374.5  374.5 28.158 8.27e-07 ***
## water_content:sampling_point 1  56.2   56.2   4.226   0.0428 *
## Residuals                  88 1170.4   13.3
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 1 observation deleted due to missingness

##                               Df Sum Sq Mean Sq F value    Pr(>F)
## water_content              1  41.1   41.1   5.082   0.0295 *
## litter                      1 409.8  409.8 50.673 9.84e-09 ***
## water_content:litter        1   10.9   10.9   1.347   0.2524
## Residuals                  42  339.7   8.1
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 1 observation deleted due to missingness

##                               Df Sum Sq Mean Sq F value    Pr(>F)
## water_content              1 17.57  17.57   3.040   0.0886 .
## litter                      1 136.47 136.47 23.607 1.68e-05 ***
## water_content:litter        1  30.72  30.72   5.314   0.0262 *
## Residuals                  42 242.79   5.78
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = oPOM_dry_mg_g ~ water_content * sampling_point, data = filter(df, sampling_point
## 
## $water_content
##          diff      lwr      upr   p adj
## Low-High 0.3272239 -1.183976 1.838424 0.6680201
## 
## $sampling_point
##          diff      lwr      upr   p adj
## End-Beginning -4.035133 -5.546333 -2.523933 8e-07
## 
## $`water_content:sampling_point`
##          diff      lwr      upr   p adj
## Low:Beginning-High:Beginning 1.890532 -0.925771 4.7068351 0.3005418
## High:End-High:Beginning     -2.471825 -5.288128 0.3444783 0.1061894
## Low:End-High:Beginning     -3.707909 -6.524212 -0.8916060 0.0047373
## High:End-Low:Beginning     -4.362357 -7.178660 -1.5460538 0.0006130
## Low:End-Low:Beginning     -5.598441 -8.414744 -2.7821381 0.0000074
## Low:End-High:End           -1.236084 -4.052387 1.5802187 0.6600819

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = oPOM_dry_mg_g ~ water_content * litter, data = df_end)
## 
## $water_content
##          diff      lwr      upr   p adj
## Low-High -1.236084 -2.666894 0.1947259 0.0885753
## 
## $litter
##          diff      lwr      upr   p adj
## Litter added-No litter 3.441571 2.010761 4.872381 1.71e-05
## 
## $`water_content:litter`
##          diff      lwr      upr   p adj
## Low>No litter-High>No litter 0.2498774 -2.4347623 2.9345170 0.9944966
## High:Litter added-High>No litter 5.0839675 2.3993279 7.7686072 0.0000496
## Low:Litter added-High>No litter 2.0620877 -0.5635416 4.6877171 0.1695169
## High:Litter added-Low>No litter 4.8340901 2.0917097 7.5764706 0.0001522
## Low:Litter added-Low>No litter 1.8122103 -0.8724293 4.4968500 0.2850381
## Low:Litter added-High:Litter added -3.0218798 -5.7065194 -0.3372401 0.0219582

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = oPOM_dry_mg_g ~ water_content * litter, data = df_beg)
## 
## $water_content
##          diff      lwr      upr   p adj
## Low-High 1.890532 0.1981251 3.582939 0.0294506
## 
## $litter

```

```

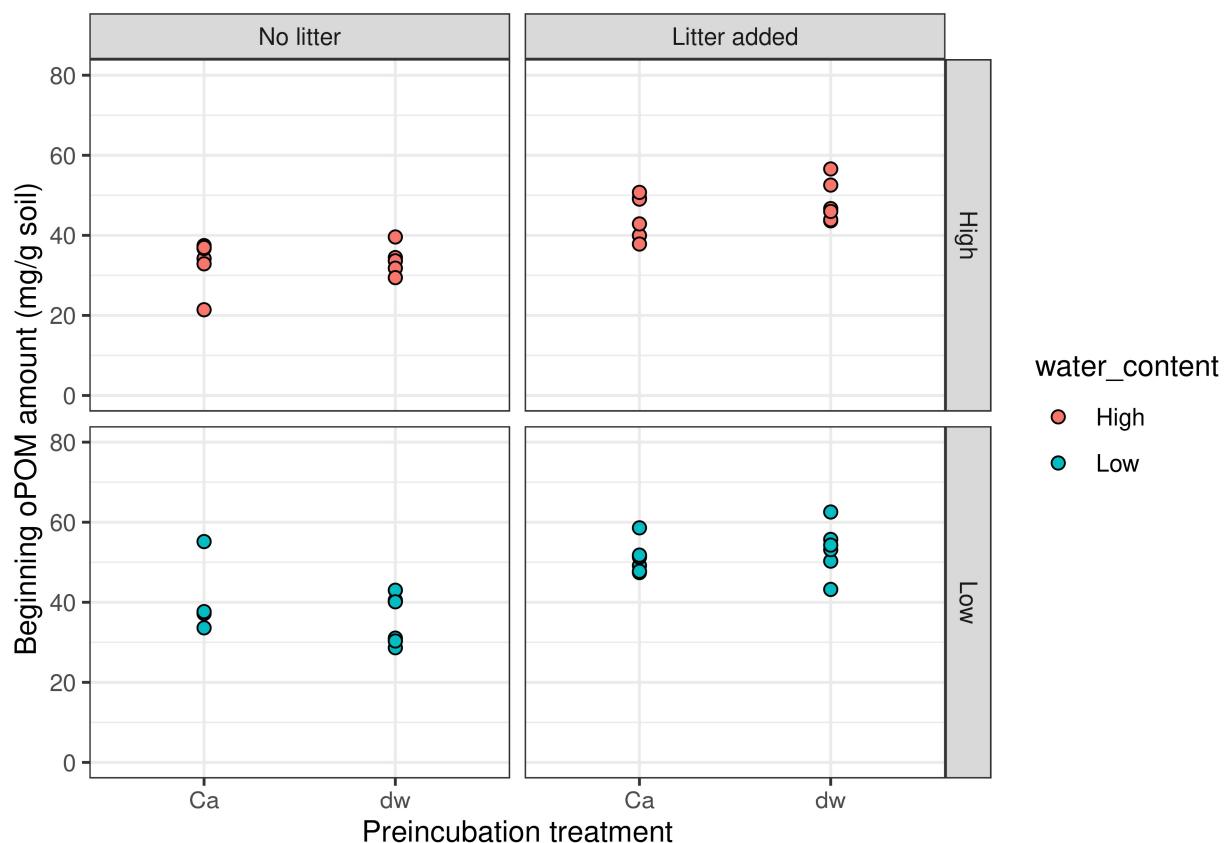
##          diff      lwr      upr p adj
## Litter added-No litter 5.975404 4.281395 7.669413     0
## 
## $`water_content:litter`
##          diff      lwr      upr p adj
## Low:No litter-High:No litter 0.874039 -2.369734 4.117812 0.8882667
## High:Litter added-High:No litter 5.001265  1.825789 8.176740 0.0007288
## Low:Litter added-High:No litter 7.823582  4.648106 10.999057 0.0000003
## High:Litter added-Low:No litter 4.127226  0.951750 7.302701 0.0063155
## Low:Litter added-Low:No litter 6.949543  3.774067 10.125018 0.0000038
## Low:Litter added-High:Litter added 2.822317 -0.283359 5.927994 0.0866704

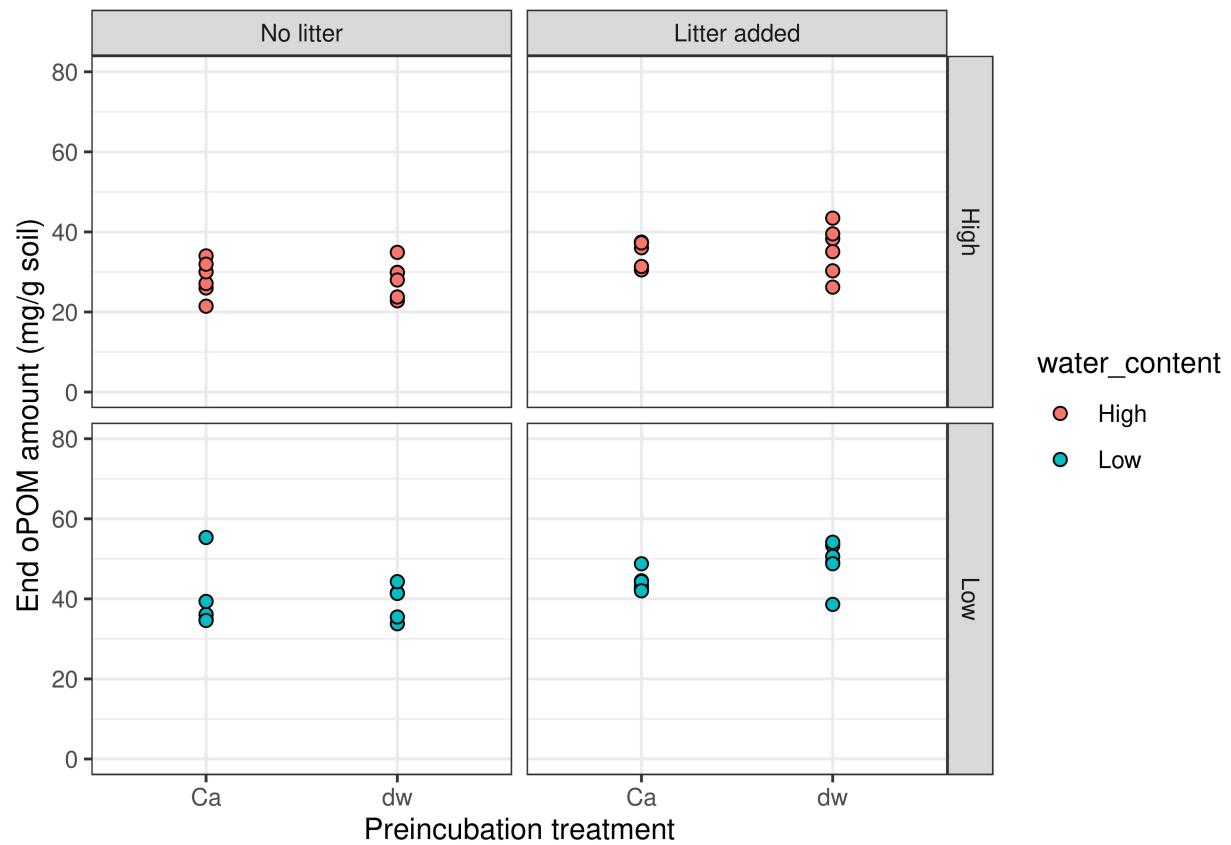
```

oPOM decreases from beginning to end in all conditions, especially in low water content when litter is added. Is this translocation to fPOM, or just preferential decomposition of oPOM vs fPOM in low water content.

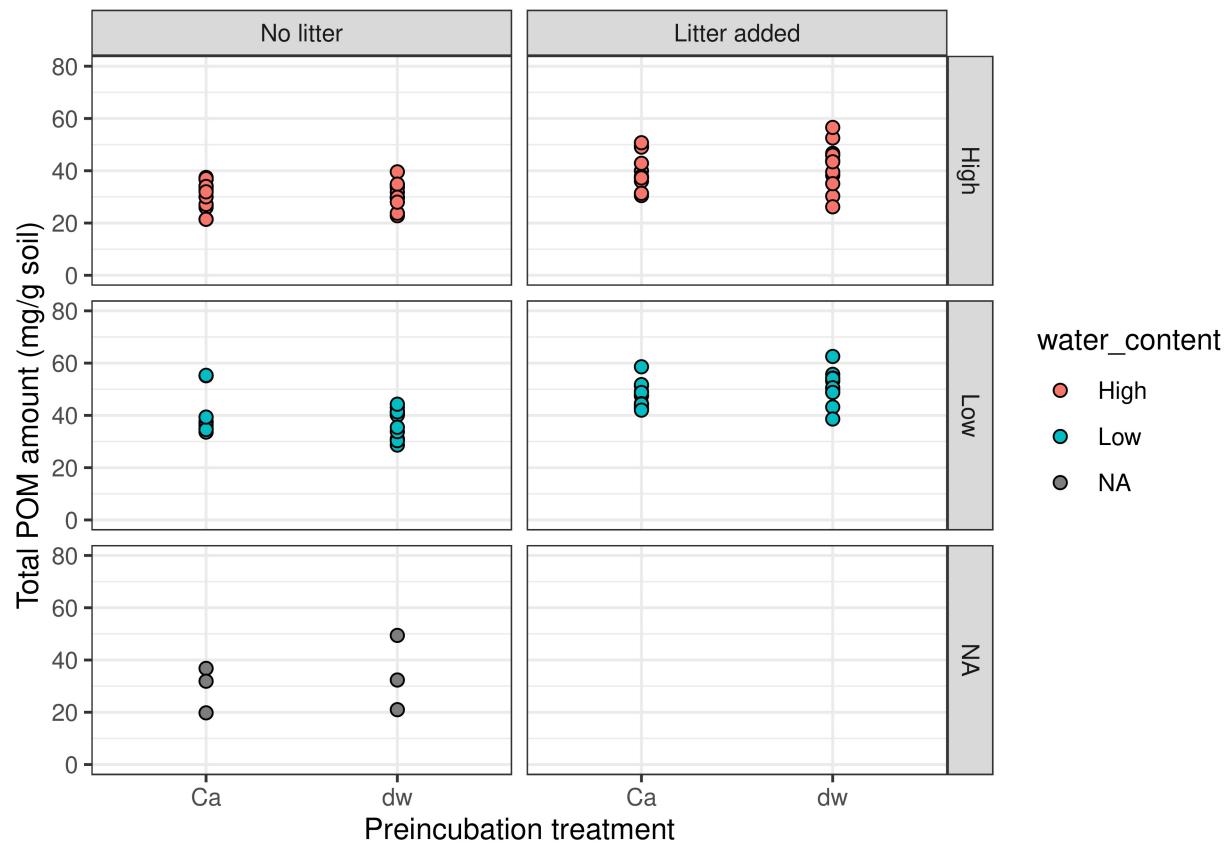
Total POM amounts

```
## Warning: Removed 2 rows containing missing values (geom_point).
```



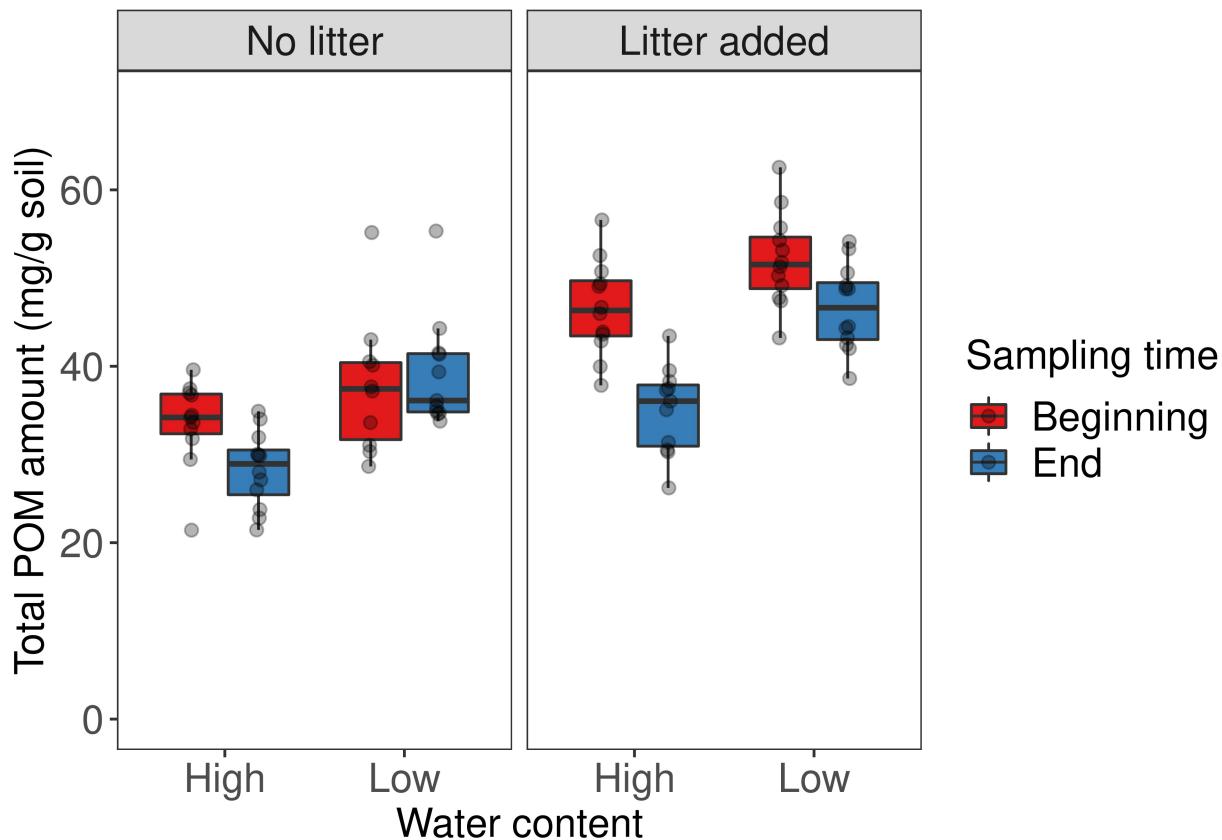


```
## Warning: Removed 2 rows containing missing values (geom_point).
```



```
## Warning: Removed 2 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 2 rows containing missing values (geom_point).
```



```

##                                     Df Sum Sq Mean Sq F value    Pr(>F)
## sampling_point                  1   708   707.6  11.822  0.0009 ***
## water_content                   1  1618  1618.5 27.040 1.31e-06 ***
## sampling_point:water_content   1   228   228.1   3.811  0.0541 .
## Residuals                      87  5207   59.9
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 2 observations deleted due to missingness

##                                     Df Sum Sq Mean Sq F value    Pr(>F)
## water_content                   1  307.9  307.9   8.972  0.00463 **
## litter                          1 2104.2 2104.2  61.311 1.14e-09 ***
## water_content:litter            1     4.6     4.6   0.133  0.71698
## Residuals                      41 1407.1   34.3
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 2 observations deleted due to missingness

##                                     Df Sum Sq Mean Sq F value    Pr(>F)
## water_content                   1 1538.7 1538.7  57.975 1.95e-09 ***
## litter                          1   575.5   575.5  21.682 3.22e-05 ***
## water_content:litter            1     1.4     1.4   0.053   0.819
## Residuals                      42 1114.7   26.5
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = total_POM ~ sampling_point * water_content, data = filter(df, sampling_point != ""))
##
## $sampling_point
##      diff      lwr      upr     p adj
## End-Beginning -5.57747 -8.801655 -2.353284 0.0009003
##
## $water_content
##      diff      lwr      upr     p adj
## Low-High 8.434605 5.210419 11.65879 1.3e-06
##
## $`sampling_point:water_content`
##      diff      lwr      upr     p adj
## End:High-Beginning:High -8.802675 -14.7785944 -2.826755 0.0012313
## Beginning:Low-Beginning:High 5.233001 -0.8104459 11.276447 0.1135642
## End:Low-Beginning:High 2.764447 -3.2114730 8.740367 0.6211317
## Beginning:Low-End:High 14.035675 7.9922287 20.079122 0.0000002
## End:Low-End:High 11.567121 5.5912016 17.543041 0.0000131
## End:Low-Beginning:Low -2.468554 -8.5120003 3.574893 0.7086643

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = total_POM ~ water_content * litter, data = df_end)
##
## $water_content
##      diff      lwr      upr p adj
## Low-High 11.56712 8.501317 14.63293 0
##
## $litter
##      diff      lwr      upr     p adj
## Litter added-No litter 7.067192 4.001387 10.133 3.27e-05
##
## $`water_content:litter`
##      diff      lwr      upr     p adj
## Low>No litter-High>No litter 10.908949 5.1565577 16.661339 0.0000484
## High:Litter added-High>No litter 6.730255 0.9778638 12.482646 0.0161557
## Low:Litter added-High>No litter 18.339847 12.7138975 23.965796 0.0000000
## High:Litter added-Low>No litter -4.178694 -10.0548062 1.697418 0.2426188
## Low:Litter added-Low>No litter 7.430898 1.6785073 13.183289 0.0066996
## Low:Litter added-High:Litter added 11.609592 5.8572012 17.361983 0.0000168

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = total_POM ~ water_content * litter, data = df_beg)
##
## $water_content
##      diff      lwr      upr     p adj
## Low-High 5.233001 1.70476 8.761241 0.0046344
##
## $litter

```

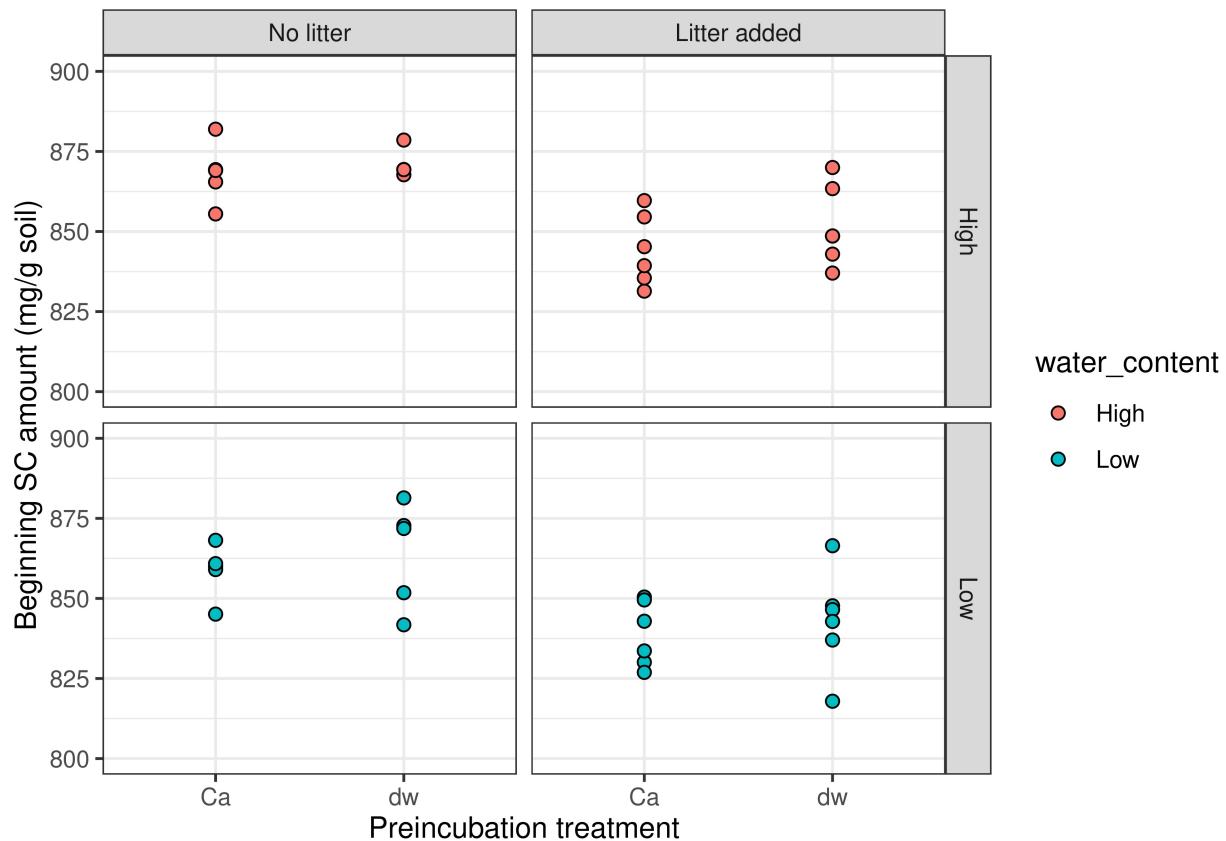
```

##          diff      lwr      upr p adj
## Litter added-No litter 13.70289 10.16766 17.23812     0
##
## $`water_content:litter`
##          diff      lwr      upr p adj
## Low:No litter-High:No litter      4.225168 -2.6287155 11.07905 0.3624866
## High:Litter added-High:No litter 13.087552  6.5396767 19.63543 0.0000208
## Low:Litter added-High:No litter 18.591389 12.0435136 25.13926 0.0000000
## High:Litter added-Low:No litter  8.862383  2.1458659 15.57890 0.0054846
## Low:Litter added-Low:No litter 14.366220  7.6497028 21.08274 0.0000062
## Low:Litter added-High:Litter added 5.503837 -0.9001113 11.90779 0.1143847

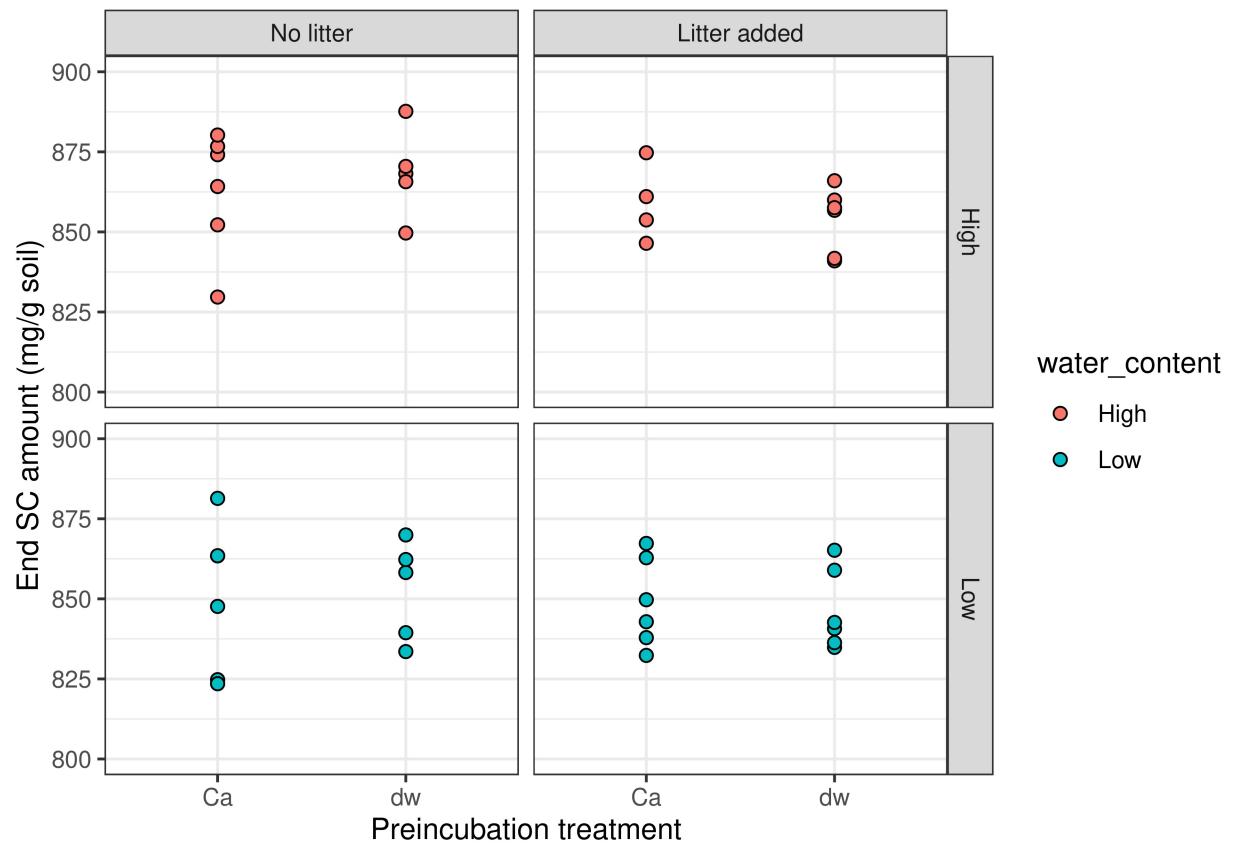
```

Total POM (fPOM+oPOM) decrease in amount from beginning to end at high water content, but remain the same at low water content (although changes in each pool). This fits the delta 13C values and indicates POM is sensitive to decomposition at higher water contents. This does not mean C loss, it could mean relative stabilization after microbial processing.

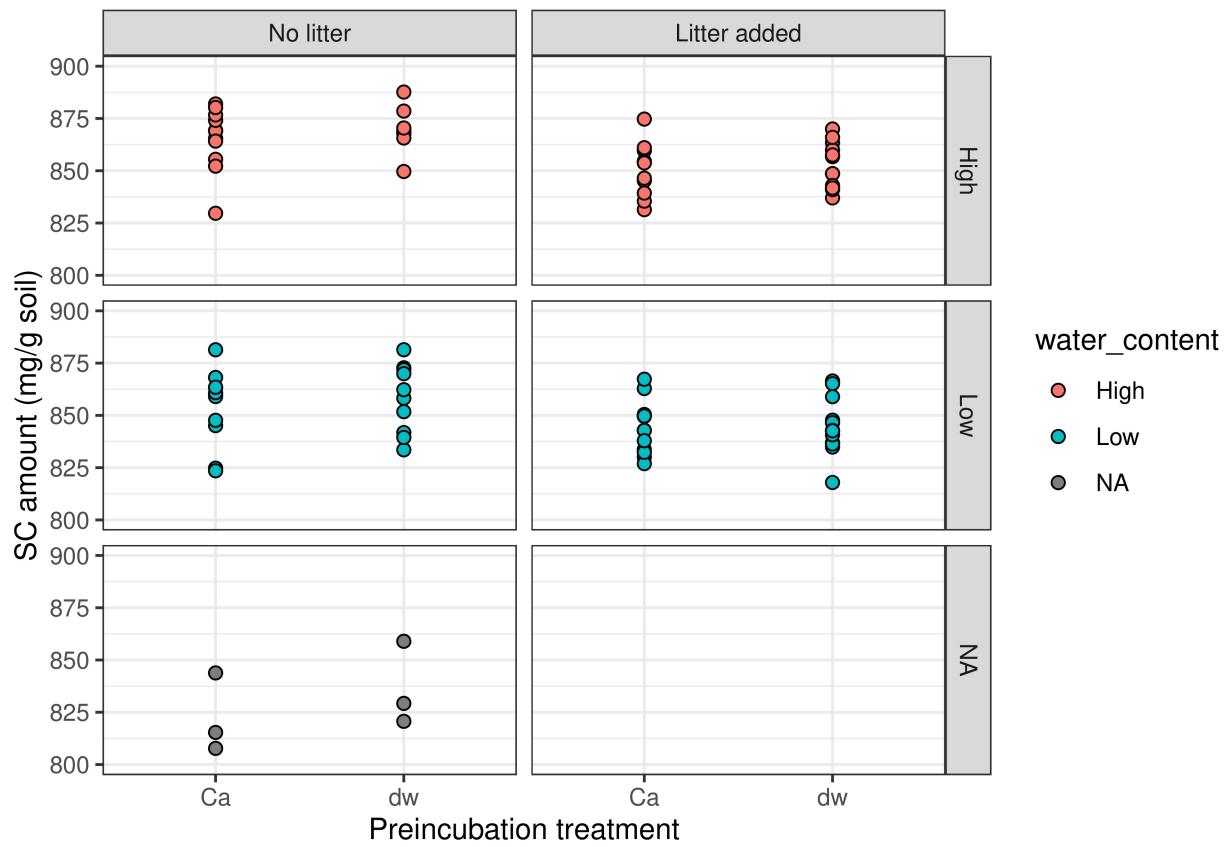
```
## Warning: Removed 4 rows containing missing values (geom_point).
```



```
## Warning: Removed 2 rows containing missing values (geom_point).
```

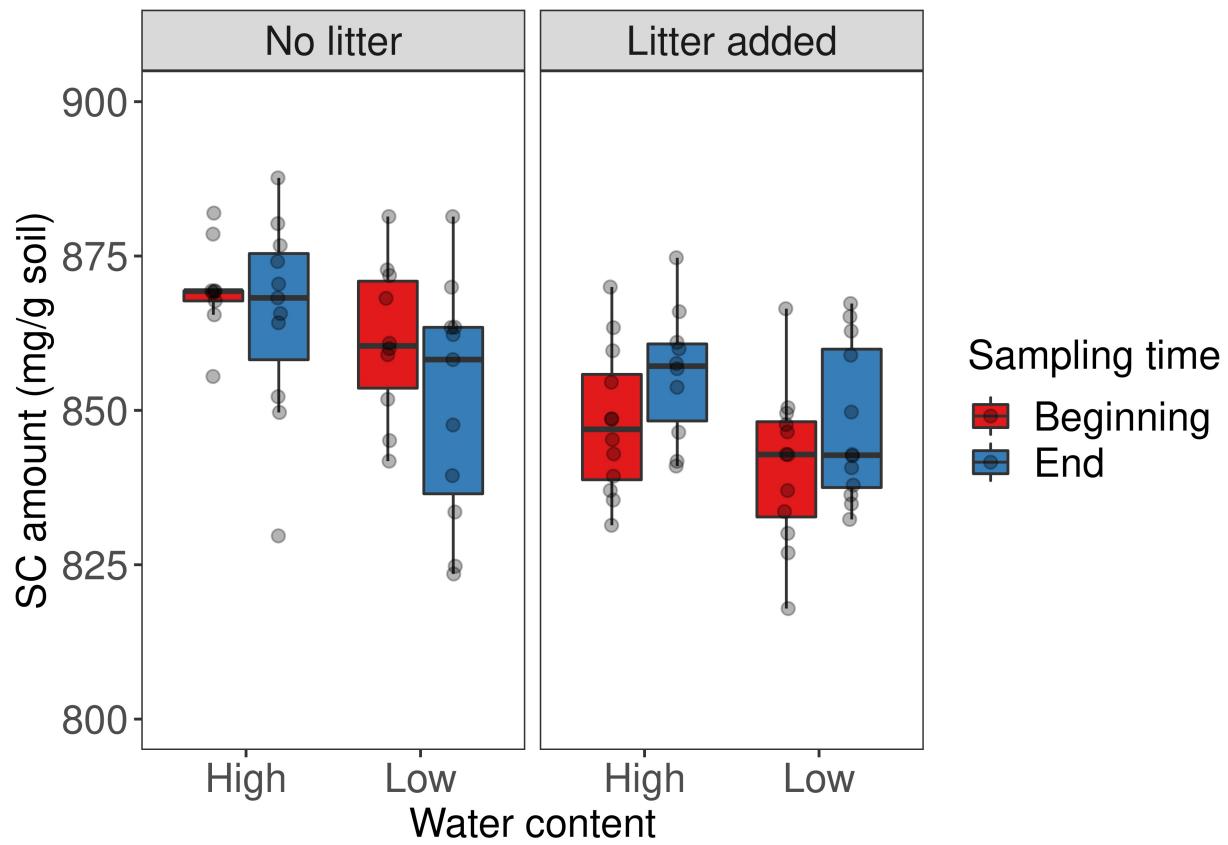


```
## Warning: Removed 6 rows containing missing values (geom_point).
```



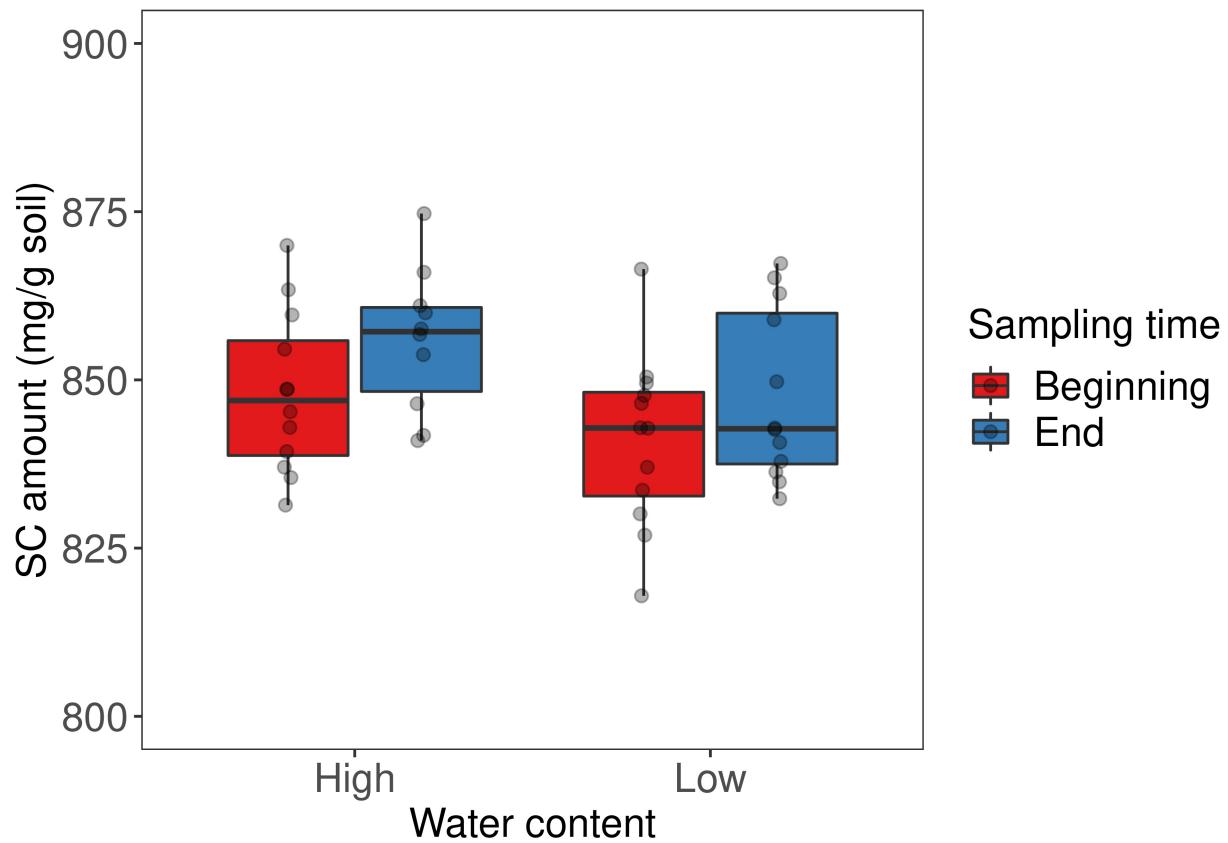
```
## Warning: Removed 6 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 6 rows containing missing values (geom_point).
```



```
## Warning: Removed 1 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```



```

##                                     Df Sum Sq Mean Sq F value Pr(>F)
## water_content                   1     7    6.6   0.004  0.951
## sampling_point                  1    79   79.0   0.045  0.832
## water_content:sampling_point   1   673   673.3   0.387  0.536
## Residuals                      88 153218  1741.1
## 1 observation deleted due to missingness

##                                     Df Sum Sq Mean Sq F value Pr(>F)
## water_content                   1   407   406.7   0.416  0.523
## litter                          1 1578   1577.9   1.613  0.211
## water_content:litter            1 2112   2112.2   2.159  0.149
## Residuals                      42 41094   978.4
## 1 observation deleted due to missingness

##                                     Df Sum Sq Mean Sq F value Pr(>F)
## water_content                   1   273   273.3   0.110  0.741
## litter                          1 1591   1591.4   0.643  0.427
## water_content:litter            1 2845   2845.5   1.149  0.290
## Residuals                      42 103998  2476.1

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = SC_dry_mg_g ~ water_content * sampling_point, data = filter(df, sampling_point != "Beginning"))
##
```

```

## $water_content
##          diff      lwr      upr      p adj
## Low-High 0.5359547 -16.7547 17.82661 0.9510214
##
## $sampling_point
##          diff      lwr      upr      p adj
## End-Beginning 1.853826 -15.43683 19.14448 0.8317666
##
## $`water_content:sampling_point`
##          diff      lwr      upr      p adj
## Low:Beginning-High:Beginning 5.946525 -26.27670 38.16975 0.9626176
## High:End-High:Beginning     7.264397 -24.95883 39.48762 0.9347420
## Low:End-High:Beginning     2.389781 -29.83344 34.61300 0.9973847
## High:End-Low:Beginning     1.317871 -30.90535 33.54109 0.9995569
## Low:End-Low:Beginning     -3.556745 -35.77997 28.66648 0.9915292
## Low:End-High:End           -4.874616 -37.09784 27.34861 0.9787985

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = SC_dry_mg_g ~ water_content * litter, data = df_end)
##
## $water_content
##          diff      lwr      upr      p adj
## Low-High -4.874616 -34.48724 24.738 0.741389
##
## $litter
##          diff      lwr      upr      p adj
## Litter added-No litter 11.75249 -17.86013 41.36511 0.427683
##
## $`water_content:litter`
##          diff      lwr      upr      p adj
## Low>No litter-High>No litter 10.358335 -45.20404 65.92071 0.9589227
## High:Litter added-High>No litter 27.519642 -28.04273 83.08202 0.5526235
## Low:Litter added-High>No litter 6.388183 -47.95289 60.72926 0.9890737
## High:Litter added-Low>No litter 17.161307 -39.59609 73.91871 0.8499357
## Low:Litter added-Low>No litter -3.970152 -59.53253 51.59222 0.9974846
## Low:Litter added-High:Litter added -21.131458 -76.69383 34.43092 0.7402742

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = SC_dry_mg_g ~ water_content * litter, data = df_beg)
##
## $water_content
##          diff      lwr      upr      p adj
## Low-High 5.946525 -12.66807 24.56112 0.5226365
##
## $litter
##          diff      lwr      upr      p adj
## Litter added-No litter -11.72475 -30.35697 6.907467 0.2111025
##
## $`water_content:litter`
##          diff      lwr      upr      p adj

```

```

## Low:No litter-High:No litter      20.101516 -15.57639 55.779422 0.4424105
## High:Litter added-High:No litter 1.840448 -33.08626 36.767156 0.9989844
## Low:Litter added-High:No litter -5.188435 -40.11514 29.738273 0.9784619
## High:Litter added-Low:No litter -18.261068 -53.18778 16.665640 0.5072766
## Low:Litter added-Low:No litter -25.289951 -60.21666 9.636757 0.2284973
## Low:Litter added-High:Litter added -7.028883 -41.18788 27.130112 0.9459215

```

