```
> model1 <- lm(yield ~ Treatment + After1970, data = Yields)
>
> coef(model1)
      (Intercept) TreatmentFertilised    TreatmentManure   TreatmentStopped    After1970Before
        1.5145833           1.9616667          3.0122222          0.8094444         -0.9035417
> confint(model1)
                         2.5 %      97.5 %
(Intercept)          1.1006485   1.9285182
TreatmentFertilised  1.4836959   2.4396374
TreatmentManure      2.5342515   3.4901930
TreatmentStopped     0.3314737   1.2874152
After1970Before     -1.2620197  -0.5450636
```

Here you have the results of a linear model using the Rothamsted data from week's 8 and 9.

The model has a response of plant yield and explanatory variables of **fertiliser treatment** and **time** (before and after 1970). The data have been plotted to the right. The first column shows the effect of treatment and the second column shows the effect of time within each treatment. So, the first column shows pre-1970 only. The second column shows both times.

Using the output from the model above, try and draw the model line (defined by the beta values/coefficient estimates) for each effect.

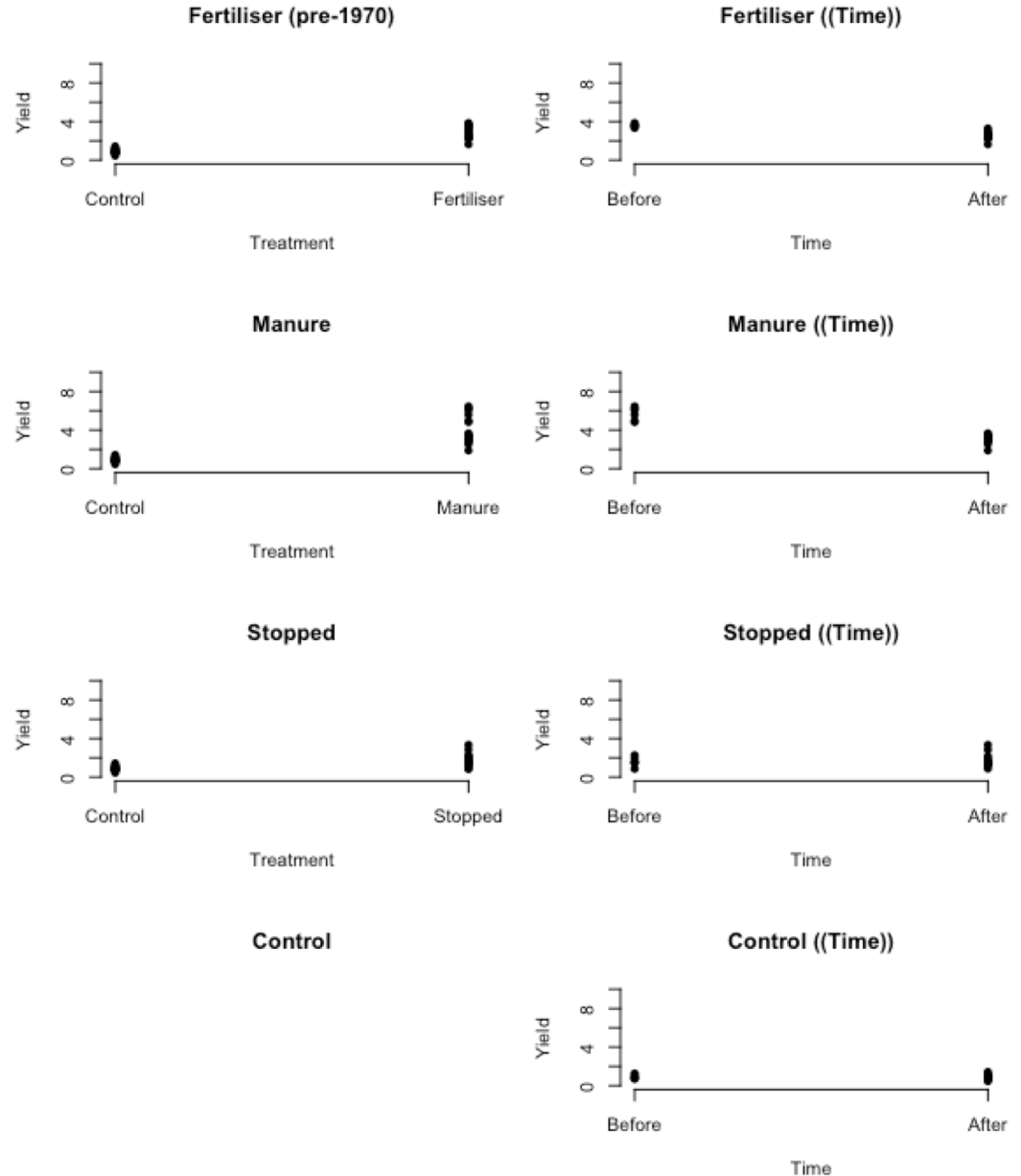**Hint:** think about how many coefficients you have so how many different slopes you expect.
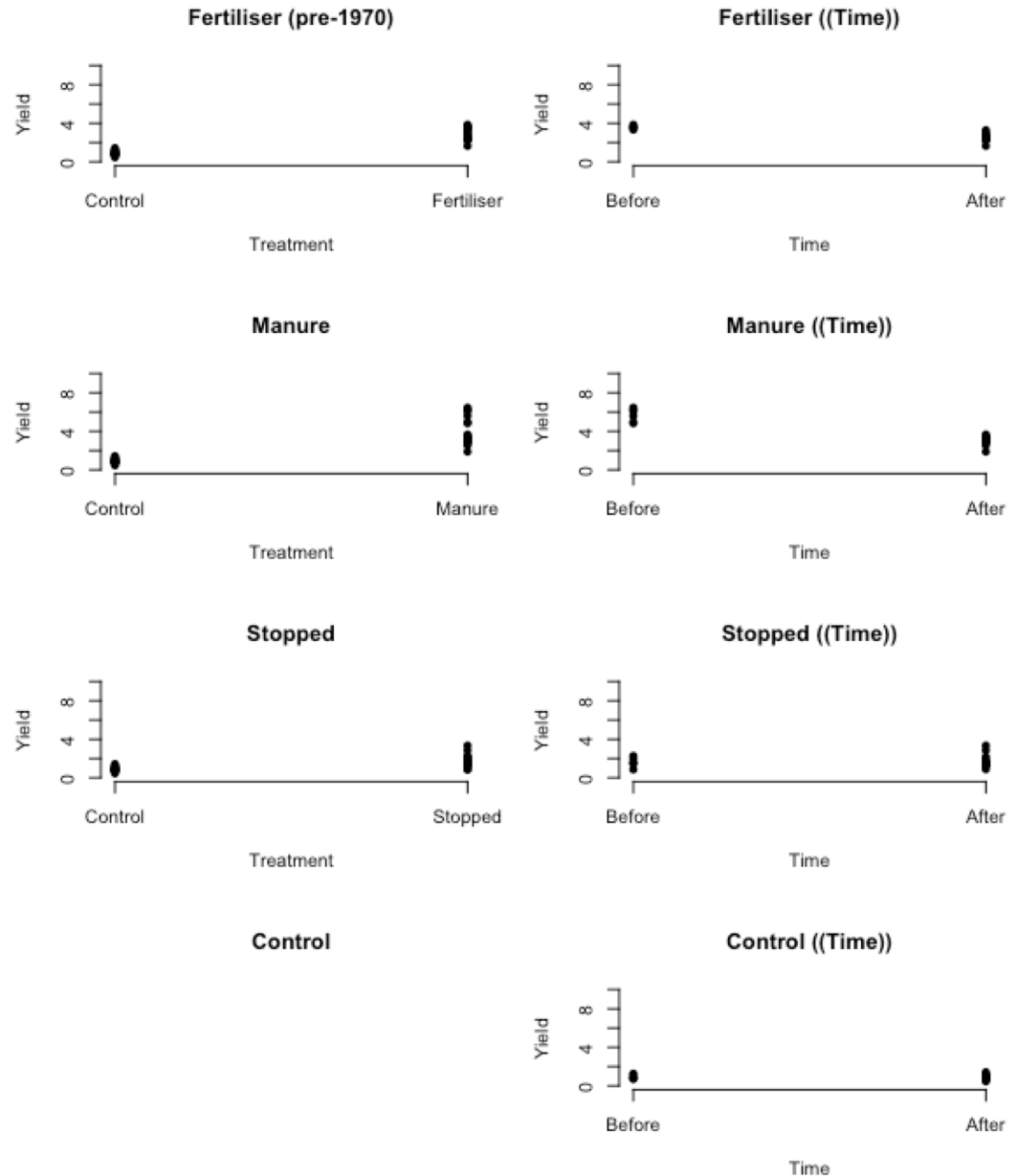
```
> model2 <- lm(yield ~ Treatment * After1970, data = Yields)
>
> coef(model2)
                   (Intercept)              TreatmentFertilised                        TreatmentManure
                    0.94166667                       2.64000000                             4.75500000
              TreatmentStopped       After1970Before TreatmentFertilised:After1970Before
                    0.68000000                      -0.04416667                            -1.01750000
   TreatmentManure:After1970Before    TreatmentStopped:After1970Before
                   -2.61416667                       0.19416667
> confint(model2)
                                              2.5 %       97.5 %
(Intercept)                               0.5499153   1.3334180
TreatmentFertilised                       2.0859799   3.1940201
TreatmentManure                           4.2009799   5.3090201
TreatmentStopped                          0.1259799   1.2340201
After1970Before                          -0.5239621   0.4356288
TreatmentFertilised:After1970Before      -1.6960332  -0.3389668
TreatmentManure:After1970Before          -3.2926999  -1.9356334
TreatmentStopped:After1970Before         -0.4843666   0.8726999
```


Fertiliser (pre-1970)

Fertiliser ((Time))

Manure

Manure ((Time))

Stopped

Stopped ((Time))

Control

Control ((Time))

Now, you have an interaction model from the same variables. Repeat the exercise from before.

How many lines do you have this time? What has changed?