Chapter 4 – Trial Design.

Quiz block 1:

Simply run these commands in R and inspect the output:

```
RCB.save$Treatments
```

```
*Blocksdesign package Version 4.8 Treatments were replaced by Replication
```

```
RCB.save$Replication
```

```
RCB.save$Design
```

```
RCB.save$Plan
```

This is a method of inspecting and accessing individual components of the blocks design output object.

Quiz block 2:

Run:

```
p.rep.2$Design
```

Then count the control variety treatments: 1 and 2. The two control varieties are automatically split evenly across blocks (5 of each control in each block).

Quiz block 3:

You could run:

```
table(p.rep.3$Design$Level_1, p.rep.3$Design$treatments)
```

Then inspect the results. Note, every block either has 2-3 of each control treatment. That only leaves space for 2 treatments that are not replicated.

Quiz block 4

a

Increase search number in the design function.

```
#Run:
latt.sq.25$Blocks_model
```

The design is better, the A-efficiency values for reps+rows and reps+rows+cols are slightly higher.

b

```
crossprod(table(interaction(latt.sq.25$Design$reps,latt.sq.25$Design$rows)
,latt.sq.25$Design$treatments))



crossprod(table(interaction(latt.sq.25$Design$reps,latt.sq.25$Design$cols)
,latt.sq.25$Design$treatments))
```

We have reached the optimum for rows. Increasing the search number has helped. Still not quite there with columns though it seems.

Quiz block 5:

Run:

```
aug.treats<-factor(c(rep(1:12,2),rep(13:36,1),rep(37,12)))

length(aug.treats) #should be 60
```

Quiz block 6:

Run:

```
aug.expt<-design(aug.treats,aug.blocks)
```

Quiz block 7:

The varieties are spread well across farm: there are either 4 or 5 of each variety placed together across farm. In terms of field, it's a bit more constricted. You have some varieties that appear twice together within the same field split, but then some that are never together.

There could be a number of reasons why field size could confound the experiment. One example is the 'edge effect'. Small fields will have a greater edge effect compared to larger fields which could influence yield results. Field size should be used as a co-factor in your analysis.