Scenario #4 : **Split-plot design.** Factor A (snowmobiling) has $a = 2$ levels with sections as EUs, factor B (harvest method) has $b = 3$ levels with zones as EUs, $n = 3$ and one has a total of $an = 6$ blocks. SSA has 1 df, SSB has 2 df, SSAB has 2 df, SSBlk has 4 df, SSE has 8 df, for a total of 17 df; one may test for A-B interaction using MSAB/MSE. With an additive model, SSE*=SSE+SSAB has 10 df, one tests for A effect using MSA/MSBlk, and for B effect using MSB/MSE*.

Scenario #5 : **CRD with a possible covariate.** One-way ANOVA with $a = 3$ levels of deicing system each with $n = 5$ replicates. Temperature is fixed so not a factor, relative humidity is measured as a covariate. I'd first fit a one-way ANOVA to the data, plot the residuals against relative humidity with the treatments color-coded, then possibly add humidity to the model as the residual plot suggest.

Scenario #8 : **CRD with a possible covariate.** One-way ANOVA with $a = 3$ levels and $n = 8$ replicates each; pH is the possible covariate. The analysis parallels Scenario #5.

Scenario #9 : **Split-plot design.** Factor A (species) has $a = 2$ levels with sites as EUs, factor B (thinning regime) has $b = 2$ levels with the halves as EUs; $n = 10$. SSA has 1 df, SSB has 1 df, SSAB has 1 df, SSBlk has 18 df, and SSE has 18 df, for a total of 39 df. With an additive model, SSE* has 19 df; MSB/SSE* is equivalent to a paired t-test, and MSA/MSBlk is the same as a two-sample t-test.

Scenario #10 : **CRD with nested random blocks.** One-way ANOVA with $a = 2$ levels, and with either days or cartons as EUs. To test for the day effect, fix a brand and perform one-way ANOVA with 3 levels of day and 5 replicates each (cartons); use the average of the two samples from each carton. In the presence of day effect, use the days as the EUs, and use the day average of 10 samples for each day.

Scenario #12 : **RCBD.**

Scenario #13 : **CRD.** One may use logistic regression with 3 treatment levels.