

Čugunovs M., Tuittila E.-S., Mehtätalo L., Pekkola L., Sara-Aho I., Kouki J. (2017). Variability and patterns in forest soil and vegetation characteristics after prescribed burning in clear-cuts and restoration burnings. *Silva Fennica* vol. 51 no. 1 article id 1718. 18 p. <https://doi.org/10.14214/sf.1718>

Supplementary file 2

R-script for performing the Monte Carlo analysis of power (simulations of the sampling outcomes)

```
# R-script for performing simulations of datasets and testing outcomes
# based on treatment means and variance within and between replicates

#####

#
mu<-c(5,4,2.6,3.8)      # means per treatment
varPlotEffects<-0.5*var(mu) # the multiplier (proportion of variance) can be changed
                          # assume that half of the variance
                          # between treatments was actually due to the
                          # normal variation between sites
sd<-sqrt(c(3,2.7,2.1,2.7)) # variances per treatment
                          # note: in the code below it is assumed that all treatments
                          # have the same variance (the maximum of these)

# We assume that there are nrep replicates of sites per treatment
nrep<-3
n<-30                  # sample size per site, change this to decide the sample size
nsim<-100             # how many times to try
p<-rep(NA,nsim)
trmt<-c("UBNC","BNC","B50","UBCC")

for (i in 1:nsim) {
  if (!(i%10)) print(i)
  ranef<-rnorm(4*nrep,mean=0,sd=sqrt(varPlotEffects)) # generate 12 plot effects
  y<-rep(mu,each=nrep*n)+
    rep(ranef,each=n)+
    rnorm(4*nrep*n,mean=0,sd=max(sd)) # generate y
  plot<-rep(1:(nrep*4),each=n) # generate plot id
  data<-data.frame(y=y,plot=plot,trmt=rep(trmt,each=nrep*n))
  mod<-lme(y~trmt,random=~1|plot,data=data)
  p[i]<-anova(mod)$"p-value"[2]
}
# Efficiency: how often null hypothesis was not rejected (p=0.05)
sum(p>0.05)/nsim
```