Restoration of understory vegetation in the Woods ~ recycled chalk powder as soil pH adjuster and deer fence ~

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In recent years the damages in the ecosystem caused by deer in the forest area have been reported. Also, the decline of <u>understory vegetation</u> should be focused on. Cedars and Japanese Cypresses were planted about 70 years ago in the school woods owned by Sagano High School, which is a *satoyama* partly becoming a mixed forest with broadleaf trees. At present, most of the known vegetation is *Dicranopteris linearis* and *Gleichenia japonica*. In some areas soil erosions are found there. The purpose of this research is to restore the understory vegetation through raising the pH level in the soil, which is to stimulate the dormant seeds to germinate and grow. For pH regulator we used *Dustless Chalk (Nihon Rikagaku Industry co.,Itd)*, whose main ingredients are calcium carbonate (CaCO₂) and 10% scallop shell powder. The germinating rate in the fertilized section was high, and also the length of leaf was shorter than that of the controlled section, and this tendency got more remarkable as the amount of chalk powder fertilizer using the Arrhenius Table (the target pH was 6.5) and put it in the surface of soil. Prior to the fertilizing experiment in the school woods, we made a pilot study to decide the temporary amount of chalk powder. We ground the sample soil taken from the ground within the root system of the conifer forest into grains under 2mm, and filled a 1/5000a wagner pot with it, at the same bulk density as that of the school woods.

"Bulk density" here means the solid phase weight per unit volume, and it was 0.966 in the school woods. We estimated the amount of chalk powder fertilizer using the Arrhenius Table (the target pH was 6.5) and put it in the surface of soil. Our test site was set up in a place in our campus that has an environment similar to the ground under the conifer trees in the school woods. Then we measured the pH in the soil by glass electrode method (soil:water=1:2.5). A month after the fertilizing we checked the result but found no difference in pH those soils by the amount of chalk fertilizer. The soil pH in the lower layer had not risen. After two months from the fertilizing, the rise in pH was measured in the depth of 11cm. To be precise, 6.68 in the surface, 5.12 in the middle, and 4.68 in the bottom layer. Now it is necessary for us to see how long the fertilizer would keep its effect. Based on the results from the researches so far, we set five square test sites with deer fences (1.8m×1.8m×0.5m) and fertilized the ground surface there with chalk powder. The location of the sites was decided considering the features and slopes of the land. All the existing vegetation were pulled out including the ones under ground, with care not to damage the soil. Our observation is still ongoing.

Keywords: soil pH, chalk, protection fences from deer