THE PRODUCTION OF BLACK BOARD CHALKS USING EGG SHELL WASTE

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ABSTRACT

Chalk is used for writing purpose in around the world. It is made of calcium carbonate or plaster of Paris. Poultry hatchery wastes the voluble egg shell calcium carbonate. Therefore objective of this study was to add value to egg shell & check properties of produced chalks. Brown egg shells were collected crushed and washed using water to remove any dirt. Then, the particles were dried under the sun and ground to a fine powder. The dried egg shell powder was added in to the boiling water and the solution was filtered using a filter paper and the filtrate was kept for 01 hr for sedimentation. Then, the sediment was dried under sunlight and dried particles were ground into a fine powder. The resulting powder was added to clean water and POP was added to the solution. Then the slurry was poured in to a mould and kept 1-2 days under sunlight for drying. In this study, five treatments with varying proportions of $Ca(OH)_2$ and POP (10:40, 20:40, 30:40 and 40:40) were added and commercial chalk was used as the control. Treatments were arranged in Completely Random Design (CRD) with three replicates for each treatment. Density, strength, proportion lost, dust flowage and pH were measured. Data were analyzed using Analysis of Variance (ANOVA) with 95% significance level. Writing quality was also measured using untrained panelists and data were analyzed using Friedman non-parametric test with 95% significance using MINITAB 14 software package.

According to the statistical analysis, suitable highest chalk strength, proportion lost, dust flowage and better sound writing quality were shown by the treatment 5 (control).Nevertheless treatment 3 (30 g (75%) egg shell $Ca(OH)_2$+ 40 g) showed the highest chalk density compare to others and treatment 1(10 g(25%) egg shell $Ca(OH)_2$ + 40 g POP) indicated suitable chalk pH value. by concerning all the results, researcher could produce the good egg shell chalk (Treatment 1) because it firstly indicated the convenience p^H value for the writer, higher chalk density compare to treatment 5 and also it indicated approximate low proportion lost, approximate close dust flowage and approximate writing quality compare to treatment 5.

Key Words: Chalk, Poultry, Egg Shell