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Sugarbeet processing precipitated calcium carbonate lime effects on a crop rotation and soil properties: sites 2 and 3.

Each year in Idaho and Oregon, 351,000 Mg of precipitated calcium carbonate (PCC) (a byproduct of sucrose extraction from sugarbeet) is produced and stockpiled at sugarbeet processing factories. Currently there are limited disposal strategies for the PCC and these stockpiles continue to grow over time. The simplest solution would be to apply the PCC directly to agricultural fields each year, however the effects of PCC on high pH soils and crop rotations in the growing area are not well understood and growers are understandably hesitant. Two studies were conducted at the USDA-ARS laboratory in Kimberly, ID to determine the effects of PCC application to a high pH silt loam soil on a sugarbeet, dry bean and barley rotation and soil properties. For each study, three PCC treatments (rate and timing) and an untreated control were evaluated. The PCC had no effects on crop yields and most soil properties. The only common effect of PCC treatments was an increase in soil phosphorus (P) concentrations compared to the control, indicating the PCC can serve as a P fertilizer. For all three crops in this study, PCC was applied at rates that resulted in applied P rates that were 1.6 to 5.3 times greater than even the highest published recommended agronomic P rates. Compared to the control, bicarbonate soil P concentrations increased by 139% and 84% when PCC was applied at a rate of 87.9 Mg ha^{-1} in Study1 and Study 2, respectively. The PCC used in this study can safely be applied at rates up to 87.9 Mg ha^{-1} to heavier textured alkaline soils in the local growing area. Disposing of PCC in this way represents a viable strategy for reducing PCC stockpiles.