

3.6 GARY W. HERGERT, MURALI K. DARAPUNENI, ROBERT WILSON, ROBERT HARVESON, JEFF BRADSHAW, REX NIELSEN

University of Nebraska, Panhandle R&E Center, 4502 Avenue I,
USA – 69361 Scottsbluff

EFFECT OF PRECIPITATED CALCIUM CARBONATE ON SOIL CHARACTERISTICS AND SUGAR BEET YIELD AND QUALITY

Effet de carbonate de calcium précipité sur les propriétés du sol et le rendement et la qualité de betteraves / Einfluß gefällten Kalziumkarbonats auf Bodeneigenschaften und Zuckerrübenenertrag und -qualität

ABSTRACT

Sugar beet processing produces large amounts of precipitated calcium carbonate (PCC). PCC has shown beneficial effects in the eastern USA but not the west where most soils are calcareous. Our objective was to investigate the effect of PCC on soil chemical and physical properties and the impact on crop yields. A greenhouse study was conducted by mixing PCC with ten soil types from Nebraska, Wyoming and Colorado, USA. Four PCC rates of 0, 11.2, 22.4, 33.6, 44.8 Mg ha⁻¹ were used. There was no significant difference in plant dry weight for sugar beet (*Beta vulgaris* L.), corn (*Zea mays* L.), and dry bean (*Phaseolus vulgaris* L.) at 7 weeks. There was no significant difference in soil pH, CEC or salinity from PCC application. PCC piles support a dense growth of Kochia (*Kochia scoparia* L. Roth) in wetter years. Seeds were collected from the three factory sites and tested for sensitivity to glyphosate, atrazine and Clarity in growth chamber studies. Kochia showed no herbicide resistance. Laboratory studies also showed that application of PCC significantly decreased root aphid population. Field studies were established at 25 grower fields in the 3 states during 2012, 2013 and 2014 growing corn, beans and beets. PCC was applied in early spring and incorporated at 0, 9, 18, and 27 Mg ha⁻¹ based on the greenhouse data. The fields were monitored for PCC effects plant growth, disease and insect severity and final yield. There were no negative effects of PCC on crop growth during the first 2 years. The three rates of PCC had no consistent significant effect ($P>0.05$) on yield or quality compared to the check on the three crops. Short and long term effects of PCC on soil physical and chemical characteristics will be presented.
