

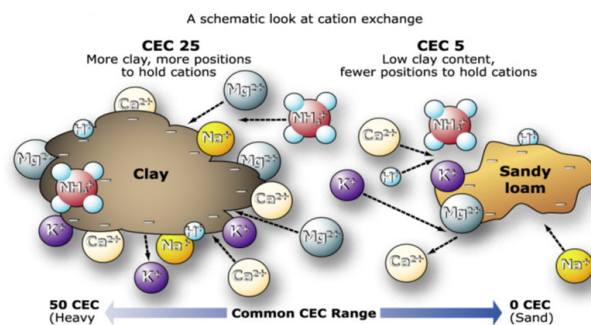
Using Cation Exchange Capacity (CEC) to Recommend Progyp Application Rates

In soil science, CEC is the maximum quantity of total cations, of any class, that a soil is capable of holding, at a given pH value, available for exchange with the soil solution. CEC is used as a measure of fertility and nutrient retention capacity. It is expressed as milliequivalent of hydrogen per 100 g of dry soil (meq+/100g). Clay and organic matter have electrostatic surface charges that attract the solution ions, and hold them. This holding capacity varies for the different clay types and clay-blends present in soil, and is very dependent of the proportion of clay and organic matter that is present in a particular soil.

In general, the higher the CEC number the higher the soil fertility.

The CEC can give insight into soil quality and site characteristics. Higher CEC likely indicates more clay, poor internal drainage, limited structure and soil compaction in high traffic areas. Low CEC is indicative of sandy textured soils prone to drought that invariably needs more organic matter to improve water holding capacity, but have open grainy structure that resist compaction.

The following table provides Progyp application rates that are recommended to maintain or improve the physical and chemical properties of soils.



CEC	Texture	Soil Characteristics	App. Rates lb/acre	Progyp Purpose
<10	Sand	Low organic matter, leachable soils, low nutrient and moisture holding capacity.	500-1000	Source of Ca and S to replace leachable nutrients and support plant growth.
10-15	Sandy loam	More desirable soil, higher clay content, improved nutrient and moisture holding capacity, more structure.	2000	Source of Ca and S to support plant growth and improve soils.
15-20	Loam	Ideal soil from a texture standpoint, higher organic matter content, more structure, improved nutrient and moisture holding capacity.	3000	Source of Ca and S to support plant growth and improve soils.
20-25	Clay loam	Higher clay content, tight soil structure restricts subsoil movement, increases compaction and nutrient run-off, soil improvement and aggregation needed.	4000	Source of Ca and S to support plant growth and improve soils.
>25	Clay	Tight soil structure due to high clay content, restricts subsoil movement, increases compaction and nutrient run-off, soil improvement and aggregation needed.	5000	Source of Ca and S to support plant growth and improve soils.

Special conditions: High sodic soils, 1 to 5 tons/acre, high magnesium soils, 2 to 5 tons/acre