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Module 3.2-3 Maximizing sugarcane yield by liming and phosphogypsum application.

Many soils in the world are acidic, which can severely limit plant development and yield by decreasing root elongation, causing Al or Mn toxicity and also decreasing the availability of nutrients such as: N, P, K, Ca, Mg, S, B, and Mo. In such soils the amelioration of such problems can be achieved by application of products that increase soil pH. Lime has been efficiently used to correct soil acidity at soil surface layers, while phosphogypsum (PG) has been successful in ameliorating acidity effects at deeper soil layers. Although PG does not significantly modify the soil pH, it is proven that it can decrease Al toxicity and add Ca to lower soil layers, which are both very important factors for root elongation. These two practices help to develop of more ample root systems, and as a consequence, improve water and nutrient absorption.

Many agronomic experiments show the positive effects of such supporting practices in terms of water and nutrient availability, and also yield. As an example, **Figure 1** shows the positive effect of liming in N absorption by corn, which is mainly due to higher nutrient availability and deeper root development when lime is utilized. **Table 1** provides another great example of a positive interaction between lime and phosphogypsum when both were used to ameliorate soil acidity and improve sugarcane yield.

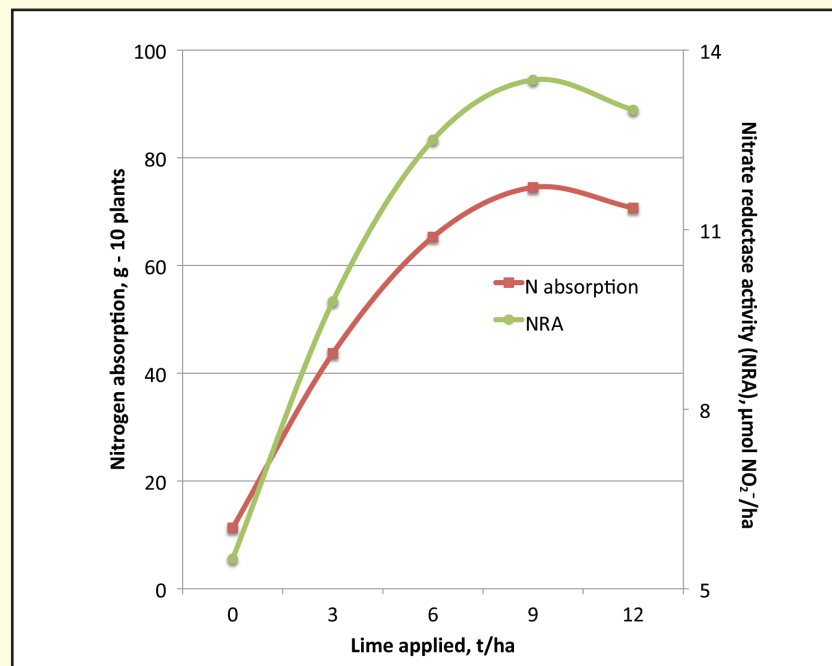


Figure 1. Nitrogen absorption by corn plants as a function of rates of lime applied (Quaggio et al. 1991).

Table 1. Increase in sugarcane yield as influenced by lime and phosphogypsum application (Morelli et al., 1992).

Lime, t/ha	Phosphogypsum, t/ha			
	0	2	4	6
0	0	7	12	13
2	11	15	18	13
4	14	22	19	19
6	11	18	15	19

References

- Morelli, J.L. A.E. Dalben, J.O.C Almeida, and J.L.I Demattê, 1992. Revista Brasileira de Ciência do Solo, Campinas, SP, v.16, n.1, p.187-194.
- Quaggio, J.A. V.J. Ramos, P.R. Furlani, and M.L.C. Carelli. 1991. In R.J. Wright, V.C. Baligar, R.P. Murmann, (Eds.). Plant-soil interaction at low pH. Dordrech: Kluwer Academim Publishers. p.327-332.

