

Historical liming experiments

Long-term effects on soil and soil water chemistry

Between 1913 and 1977 a number of forest liming experimental sites were established in Sweden. In 1982 and 2000 these sites were reviewed.

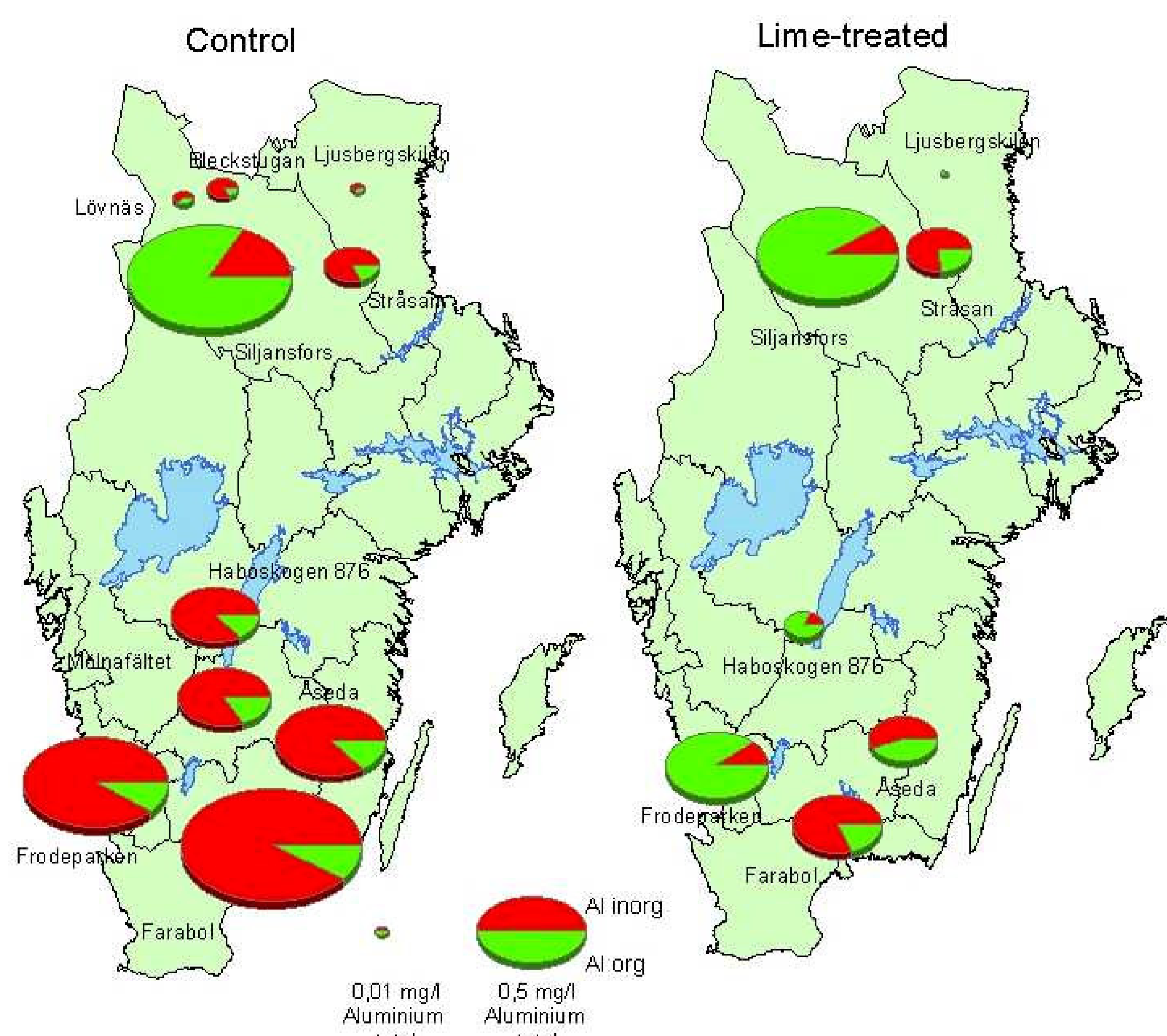


Figure 1. An important result from the review was the discovery of significantly lower amount of inorganic aluminium on lime-treated plots.

Aluminium decreased...

As a result of liming, the amount of inorganic Al in soil water at 30-50 cm was significantly lower on treated plots compared to control plots in 2000, figure 1. Also, the total amount of Al (inorganic and organic) was lower on treated plots while the acid neutralising capacity (ANC) was higher.

...while base saturation increased

Liming also caused significant higher base saturation compared to control plots at the same depths, figure 2. This can be explained by an increase in Ca-ions rather than a decrease in H- and Al-ions.

Conclusion

Liming is an effective tool in order to reduce the negative effects of acidification (low pH, low ANC, low BS and high inorganic Al-content), in deep soil horizons. As a consequence, the quality of soil water, and possibly run-off water, improves as well as the habitat of fish and other water-living organisms in near-by streams and lakes. However, it may take as long as 10-20 years to achieve an effect but it may last up to 40 years or more, figure 3.

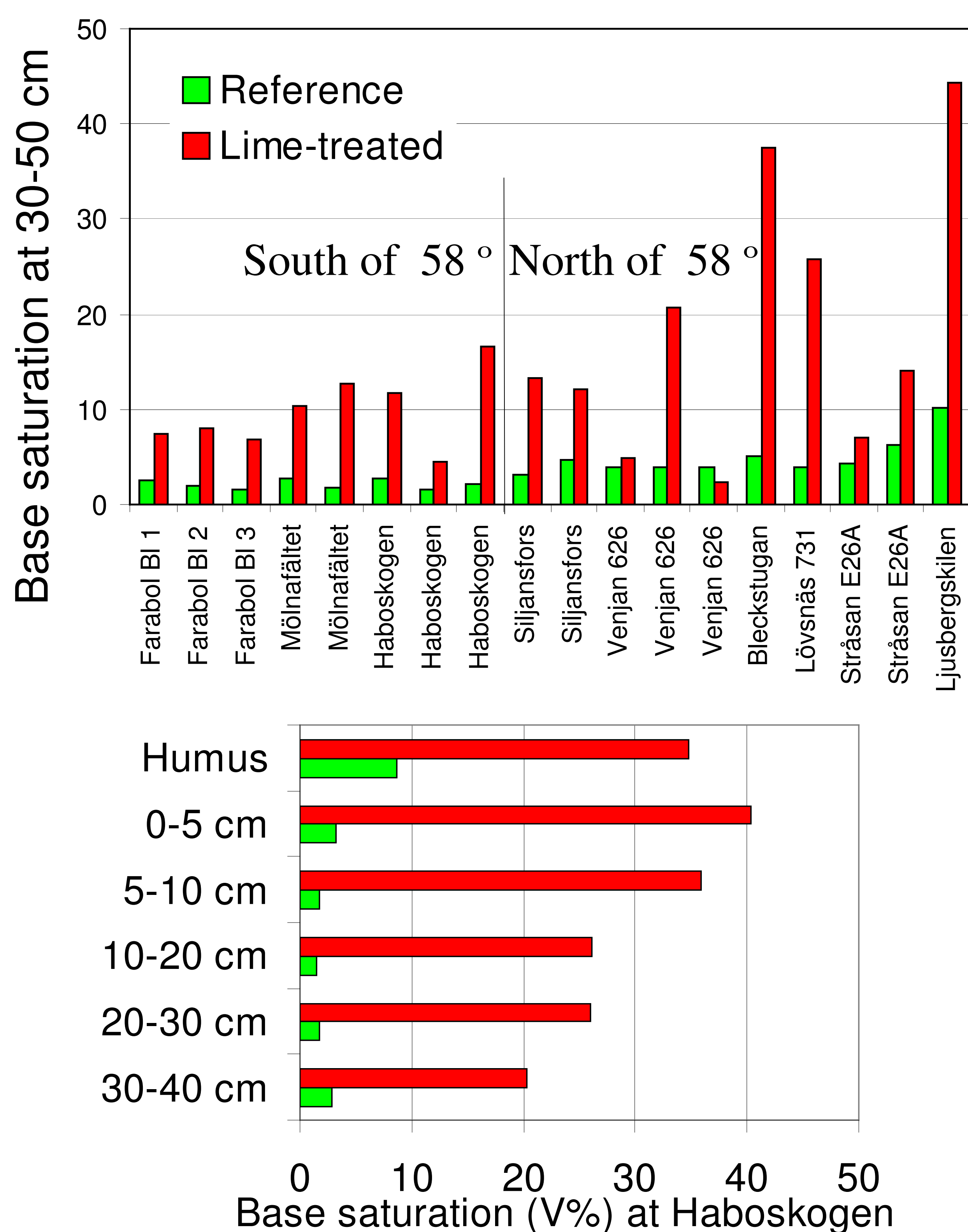


Figure 2. Base saturation of deep soil horizons (30-50 cm). In 1967, Haboskogen was treated with 2.3 tons lime/ha. 40 years after treatment, the whole profile is positively affected.

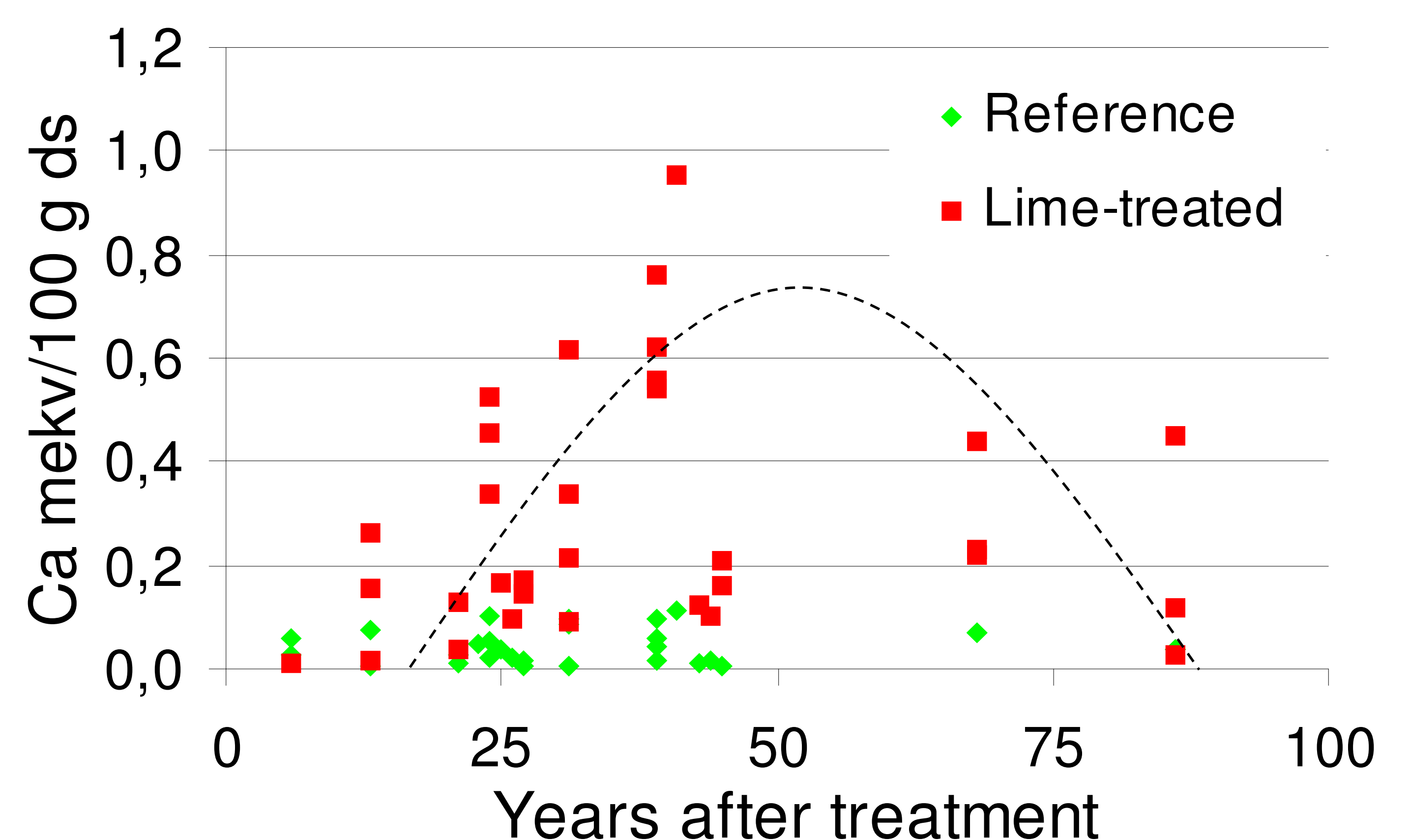


Figure 3. Exchangeable Ca in the mineral soil (30-50 cm).