

Regenerative Agriculture - pasture mixes

Renew pasture

Sow

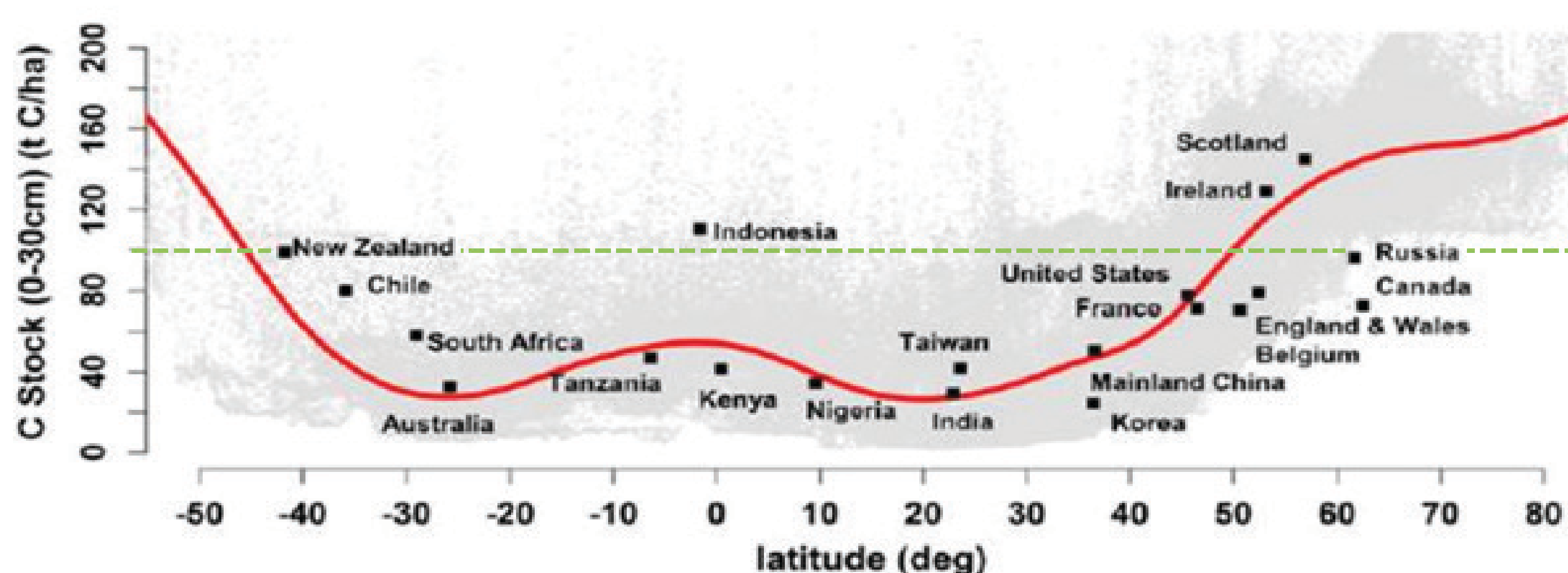
Regenerative Agriculture (RA) is presently a topic of discussion world-wide. This section looks at two aspects of RA in the context of New Zealand's grazed livestock systems - the improvement of soil and soil carbon/organic matter.

RA itself is not a specific, defined system, but incorporates several components which aim to improve soil quality and increase soil carbon. These are already well-established in NZ farm systems, i.e. using pasture, rotational grazing, minimum-till cultivation, and minimising bare soil with cover crops.

Organic matter & soil carbon

Scientists estimate NZ soils on average contain 99 t/ha soil organic carbon (SOC). This is higher than many other countries, such as areas of North America, South Africa and Australia. There are several reasons for this, including our latitude and cooler climate as shown below.

Global soil organic carbon by latitude (Minasny et al. 2017)

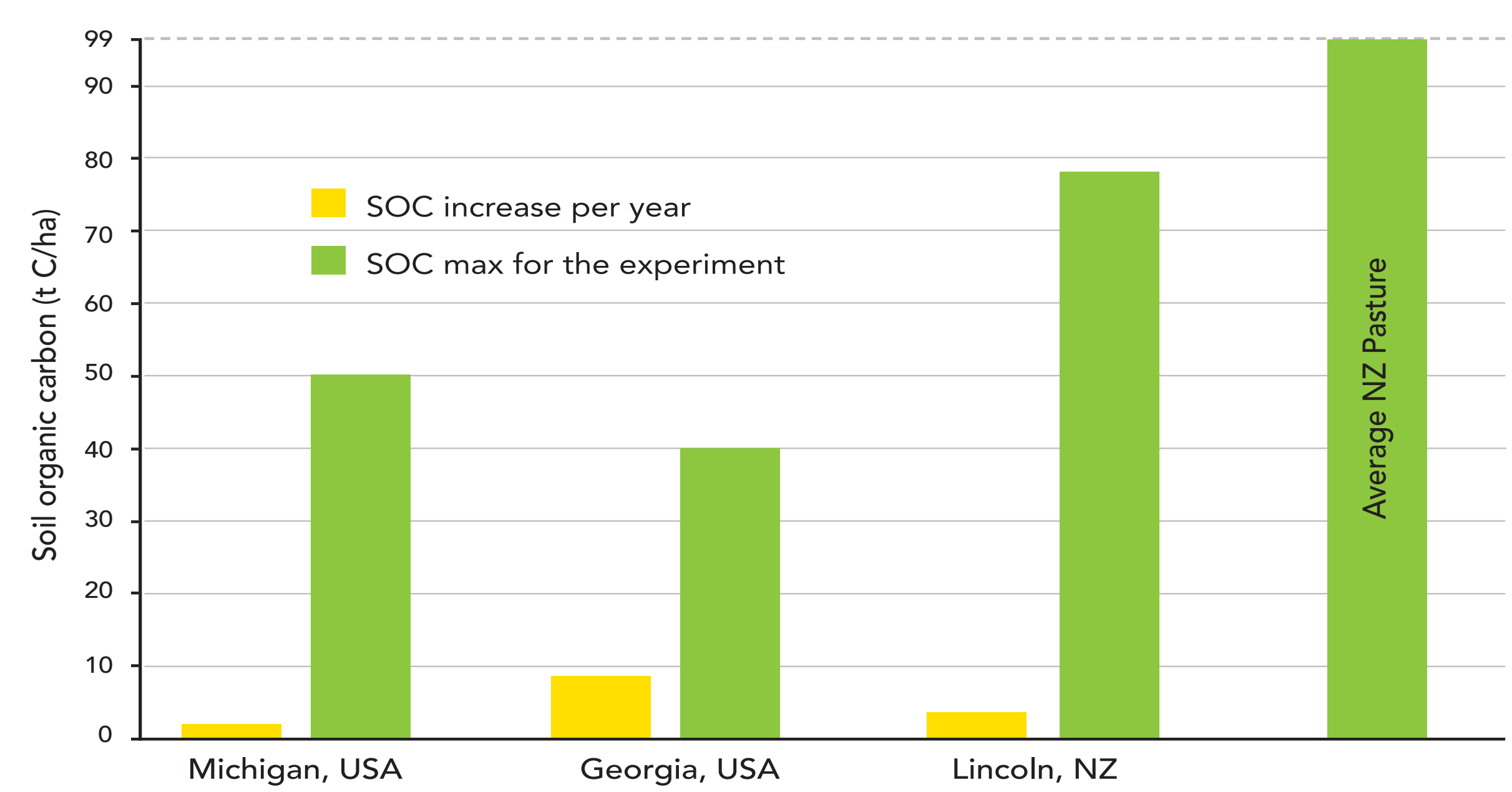


New Zealand agricultural soils are dominated by permanent pasture, rotationally grazed by stock. This is not the case in many other countries. Some overseas farmland has historically been heavily cultivated and cropped, which inevitably depletes soil organic matter. It is primarily in these 'degenerated' carbon-poor

soils that RA practices have been associated with ‘regenerating’ as can be seen in the graph.

For example an increase of SOC of 4 t/ha/year was estimated in Michigan, USA, to 50 t SOC, through changing from set stocking to rotational grazing (Stanley et al. 2018); or an increase of SOC of 8 t/ha/year was estimated in Georgia, USA, to 40 t SOC, through conversion from cropping to sowing pasture and rotational grazing (Machmuller et al. 2015).

Soil organic carbon levels and increases in three experiments



In Lincoln, NZ, an increase of SOC of 5 t/ha/year was estimated, to 77 t SOC, through sowing a degraded cropping soil into pasture (Francis et al. 1999). In this trial the same increase in SOC came from sowing a pasture of straight perennial ryegrass, versus a pasture mix of prairie grass, timothy, tall fescue, chicory, lucerne, white clover and red clover.

Diverse seed mixes for pasture

While most of RA focuses on the use of pasture, minimum-till establishment and rotational grazing, some proponents suggest sowing diverse seed mixes. For pastoral-based soils in NZ which are typically rotationally grazed and high in SOC, there is presently no scientific evidence that sowing a very diverse pasture seed mix will increase soil carbon.

For more information on this see Diverse pasture mixes, and our Diverse Pasture Premix.