

Winchmore South Canterbury Research - Soil & Pasture Measurements Compared

At Winchmore in South Canterbury on stony silt soils, measuring perennial ryegrass and clover pastures during 34 years of fertiliser trials under border dyke (strip) irrigation, showed the pasture figures changed gradually as expected, whilst the soil test figures went up and down for no reason. Some supporters of soil tests will say that they are just guides and that the optimum range is between an Olsen P of 15 to 30. This 100% variation shows how ridiculous Olsen P is in New Zealand, confirmed by the figures below. The Olsen P system was developed in USA on their alkali soils, for alkali soils. New Zealand soils are almost all acid.

Winchmore Irrigation Research Station, South Island, NZ.

A similar annual fertilising programme showing annual test changes.

Soil Olsen P levels jumped up and down while pasture P levels were fairly consistent.

Sampling was done by research people.

----- Phosphorus Osen P -----				----- Potassium -----				
Yr	Soil	Change	Herbage	Change	Soil	Change	Herbage	Change
87	7	NA	0.53	NA	0.22	NA	2.6	NA
88	13	85%	0.62	17%	0.63	186%	3.5	35%
89	14	7%	0.59	-5%	0.32	-50%	3.0	-14%
90	9	-36%	0.54	-9%	0.33	3%	2.5	-17%
91	12	33%	0.52	-4%	0.61	85%	2.9	16%
92	14	17%	0.53	2%	0.35	-43%	3.0	3%
93	23	64%	0.53	0%	0.76	117%	2.3	-23%

It is pasture uptake that matters, because that is what is available in the soil, and is what the animals are eating, not what the typically variable soil figures show.

Calcium - One application of lime was applied in early 1987.

Yr	Soil Ca	Change	Pasture Ca	Change
87	69	NA	1.02	NA
88	70	1%	0.72	-29%
89	87	24%	0.59	-18%
90	69	-21%	0.71	20%
91	73	6%	0.66	-7%
92	75	3%	0.70	6%
93	72	-4%	0.66	-6%

The variations in the pasture levels could be because the percentage of clover in the sample varied. The optimum clover calcium level is 1.3% and ryegrass 0.8%. Mixed pasture analyses are usually based on 75% ryegrass and 25% clover. If the percentage of each is not exact, the analysis figures will vary, which is one of the reasons for my changing to analysing ryegrass on its own. Another is that so many farmers not applying enough calcium and too much urea, have caused the death of all clovers. Read Minerals > Calcium and Nitrogen.

The pH varied up and down between 5.8 and 6.5 despite no more lime being applied. The pH in 1993 was 6, but calcium deficiency symptoms were apparent.

Measuring calcium in ryegrass and counting and checking the earthworms, are very accurate at deciding lime requirements. Read Soils > Earthworms. Measuring soil calcium and pH are not.

The pH in 1993 was 6, but calcium deficiency symptoms were apparent. The fertiliser consultant went by soil tests, so said no lime was necessary. In 1993 the consultant was changed and lime was applied with beneficial results. Remember that lime needs serpentine and boron to get results.