Forage Fact # 37

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Sutherlands Soil Says Peas Please!

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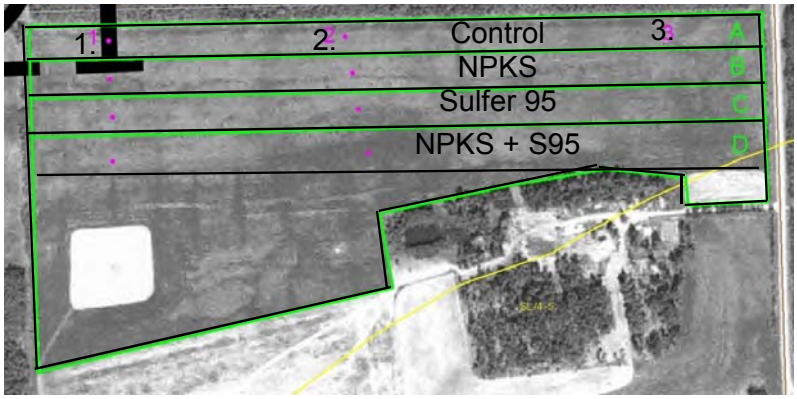
"To me, the best part was getting soil tests back & discussing them with Sandra & Julie to make management decisions."
Chuck Sutherland, Groundbirch

Sutherlands' Soil Ambitions

Soil quality is challenging to maintain and improve in the Sutherlands' loamy sandy soil. This Beryl soil is moderately to well drained and innately has very little organic matter, about 2 to 4 %. The soil structure is very fragile and makes it very susceptible to degradation after intensive tillage practices such as plowing and discing.

Chuck and Pat decided that they were more interested in improving their soil quality and the long-term benefits than in getting high yields. They wanted to increase their organic matter and improve the soil structure through applying nutrients and winter feeding in this field.

Chuck and Julie discussing legumes and their nitrogen fixing ability, which in turn increases soil quality.



The Treatments

There were 4 different treatments in the 28 acre field.

Treatment A: (north treatment) remained as a control and had no nutrients applied to it.

Treatment B: 380 lbs/ac of N-P-K-S (21-9-14-2) floated June 25, 2001 .

Treatment C: 30 lbs/ac of Sulfer 95 applied with whirly-gig early July, 2001.

Treatment D: 380 lbs/ac of N-P-K-S (21-9-14-2) & 30 lbs/ac of Sulfer 95 with a whirly-gig July, 2001.

Benchmark System: Each treatment has 3 benchmarks which are comparable across the field, this simplifies the field variability. Data is collected from each set of benchmarks during field sampling and then compared, to draw conclusions about treatments.

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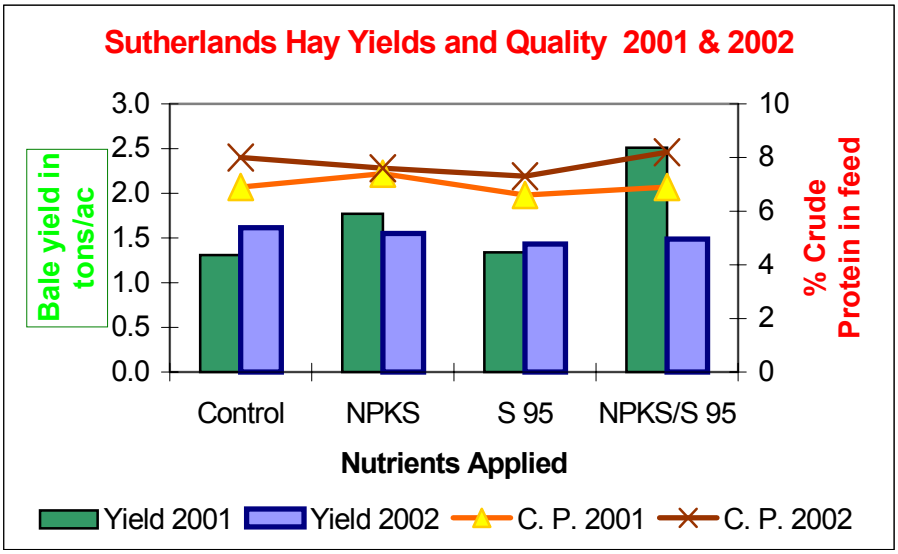
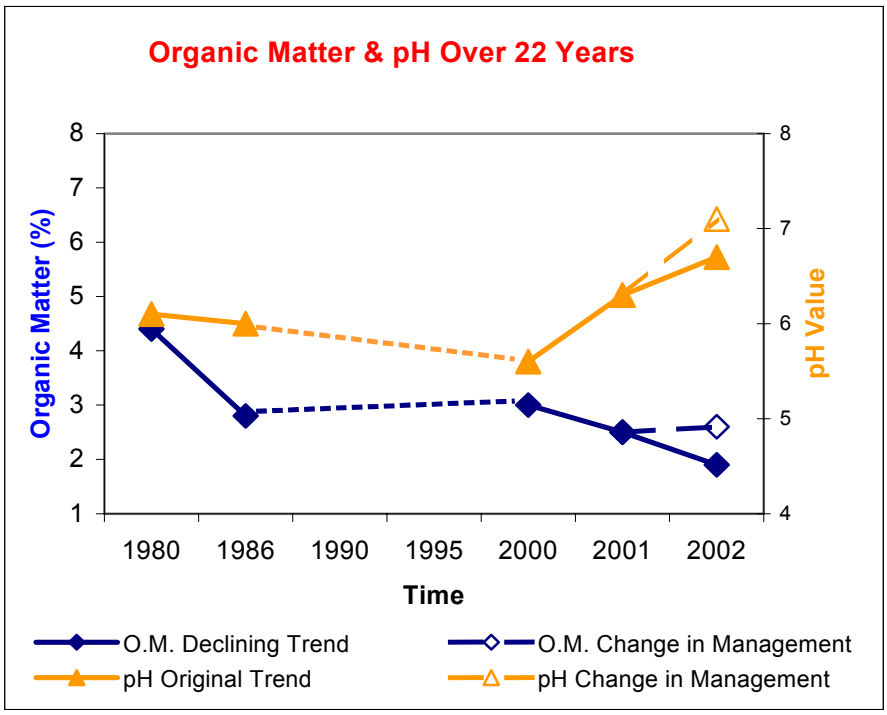


2002: There didn't appear to be any residual effect on hay yields and quality from fertilizing the year before (see *above)*. However, oats and peas stands were healthier and thicker where nutrients were added *(see counts at right).* What is really interesting is the increase in pea plants stem numbers and heights where phosphorus is added. Phosphorus plays a major role in root growth and increasing legumes ability to fix nitrogen.



Results

The oat and pea green feed showed exciting responses to the added nutrients.

2001: The field which received the NPKS + Sulfer 95 appeared to have the greatest response with regards to the yields and quality. Oats can often tolerate nutrient deficiencies better than other crops. However, wherever any of the nutrients were applied, the oat plants were greener, had less disease on leaves and the field showed less variability in plant densities and heights.

2002 Plant Counts	# Oats	# Peas
Control	8	2
NPKS	20	4
S95	18	4
NPKS+S95	18	3

What the Soil Tells Us!

Soil samples were taken in 1980, when the Sutherlands were changing their cropping rotation. In the late 80's and 90's, hay yields declined as the banked inherent fertility and organic matter were depleted *(see diamonds to left*). By adding nutrients to the soil and adjusting their management, the Sutherlands were able to stop the trend of declining organic matter.

The pH has also showed some responses to the addition of nutrients. Beryl soils have poor buffering capacity; therefore it is easy to change their pH *(see triangle line to left)*.

By a combination of applying fertilizer and manure, growing peas, adding crop residues and winter feeding Sutherlands have improved their soil.

Compiled by: Sandra Burton & Julie Robinson in April, 2004.
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