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Clarkes Boost Forage Quality

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*“That field has huge rocks
and erodible soils.
If there is any way
we can avoid working
it, we have to look for it.”
Brian Clarke,
Sunrise Farms*

Tell Me Why?

After talking with Brian Clarke about the winterkill occurring on his land, Brian posed 2 questions:

1. Why are we getting shorter longevity in legume stands?
2. How can we manage the fields' soil nutrients to extend legume stand longevity, & reduce tillage.

Field History

The alfalfa stand is over 15 years old. In the mid 90's a strong chinook wind and thaw removed snow off the northern half of the field. Temperatures dropped and froze this bare ground leading to extreme decline in the plants in that portion of the field. The following spring, a 10 ft zero till hoe drill was used to reseed this portion of the field and there was an excellent catch.

In the spring of 2001, Sandra Burton, Tom Pittman and Brian Clarke took plant density counts. They also took



Brian Clarke in field looking at alfalfa plants from top to bottom, to determine winter hardiness.

soil tests from poor and better growth areas and recorded the field conditions. The field was visually declining in alfalfa plants #s and lower forage quality vegetation was replacing the desirable legume plants. Something had to be done to increase quality and quantity. Due to the rocky soil type and susceptibility to erosion, Clarkes wanted to delay mechanical rejuvenation as long as possible.

Location: SW 30-83-16-6

A3	B3	C3	D3	E3
A2	B2	C2	D2	E2
Control	N-P-K-S Blend	Sulfer 95	KCl	Manure
A1	B1	C1	D1	E1

Brian Clarke's 5 treatments

The Treatments

There were 5 different treatments in the 35 acre field:

Treatment A: remained as a control and had no nutrients applied to it. (Closest to the road)

Treatment B: 180 lbs/ac of N-P-K (24-12-8) was applied with a floater, and 35 lbs/ac of Sulphur (Sulfer 95) was broadcast with a whirly-gig.

Treatment C: 35 lbs/ac of sulphur or Sulfer 95 was applied with a whirly-gig.

Treatment D: 85 lbs/ac of potassium or KCl (0-0-62) was applied in the fall of 2001 with a floater truck.

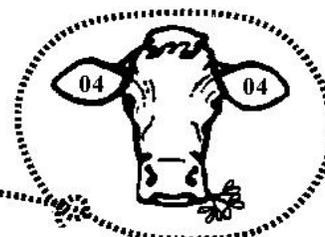
Treatment E: 4.5 tons/ac of fresh wet manure (from the milk parlor) was applied in the fall of 2001 with a manure spreader.

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Soil Landscape Type

Codessa - Donnelly soil: is a well drained, sandy loam beach or fluvial veneer over clayey lacustro till deposits on gently sloping land.

2 yr Economics of Fertilizing

Yield advantage: \$/ac

Yr 1: 0.5 T/ac x \$50/T \$25

Yr 2: 0.2 T/ac x \$50/T \$10

Total: 0.7 T/ac \$35

Quality advantage:

Yr1: 2.3% x \$6/T * x 1.8T \$25

Yr2: 3.7% x \$6/T x 0.9T \$20

Total: 6% adv over 2 yr \$45

Costs: Cost of NPKS \$39

Cost of applying \$5

Total costs \$44

Net Benefit over 2 yr \$36

*Based on: canola meal at \$236/tonne = \$0.30/lb CP x \$20lb/T(1%) = \$6/Ton

1 yr Economics of Manuring

Yield advantage: \$/ac

0.6 T/ac x \$50/T \$30

Quality advantage:

2.3% x \$6/T x 1.3 T \$18

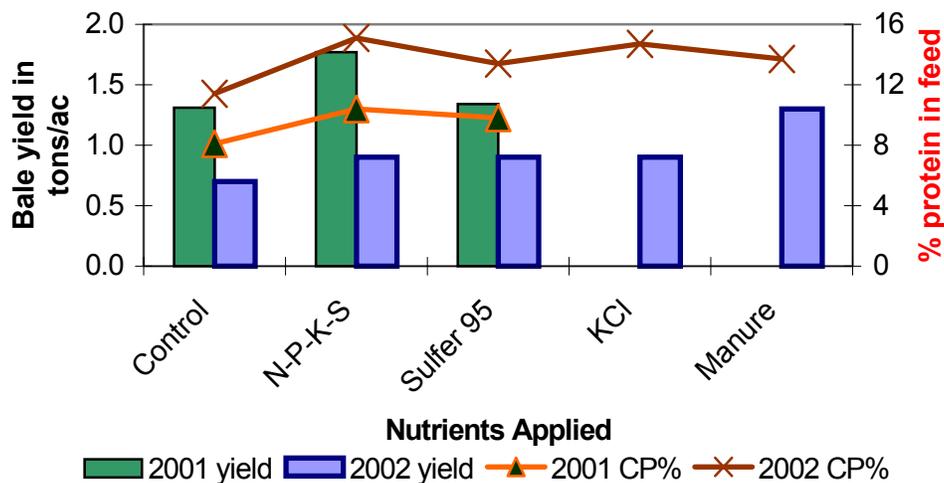
Manure applic \$/hr \$120

Total costs: \$26

Net Benefit for 1 yr* \$22

*Note: Residual effect of manuring was apparent but not measured in 2003.

Clarke's Hay Yields and Quality in 2001 & 2002

**Results**

The hay field showed exciting responses to the nutrients in both 2001 and 2002.

2001: Yields increased with the 2 treatments. The sulphur (Sulfer 95) treatment showed a small increase in yields (~10%); while the N-P-K-S treatment wed a yield increase of $\frac{1}{2}$ ton/ac or 40%. Quality differences also showed up with an increase in protein levels in the feed with a 2% increase in the N-P-K-S blend (see *triangle line on the above graph*).

2002: The carryover effects in 2002 yields of applying fertilizer in 2001 were less because of poor moisture conditions. However, some residual yield and quality responses could still be seen in treatments B and C.

The fall applied potassium or KCl resulted in an increase of 0.2 tons/ac. The manure application in fall 2001 doubled the yield.

The quality of forage was better in the treatments in 2002 where nutrients had been added in 2001. The control had a crude protein level of 11% and the treatments were all above 13%. Note that the quality of forage can be higher in drought years (see *X line 2002 above*).

What the Producer Learned!

Brian was excited about the increase in quality on his forage stand over the 2 years. The increase in quality alone helped justify the expense of applying nutrients to the field.

The manure treatment showed an increase in both yield and quality. For Brian, applying the manure is easy and cost effective when the field is close to the manure (within 2 miles). However, using a fertilizer/ floater can be more economical for more distant fields and ensure a timely application. In summary, nutrient application to forage stands definitely pays.

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

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