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Crop Soil News

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"It is the crops
that feed the
cows that make
the milk
which creates
the money."

Advanced Ag Systems
Research, Education, Consulting

Maximize Protein from Winter Forage and Grasses

Each year more farms are adding winter forage, especially triticale, to their crop toolbox. The high yields and very high-quality forage quality are a real bright spot in this gloomy economic condition on many dairy farms. High yield of high quality is not something you buy, but rather through the application of management. Research, much supported by NY Farm Viability, over the past 18 years (and still on-going) shows that fall and spring nitrogen plus sulfur are critical. The key question: when and how much are enough?

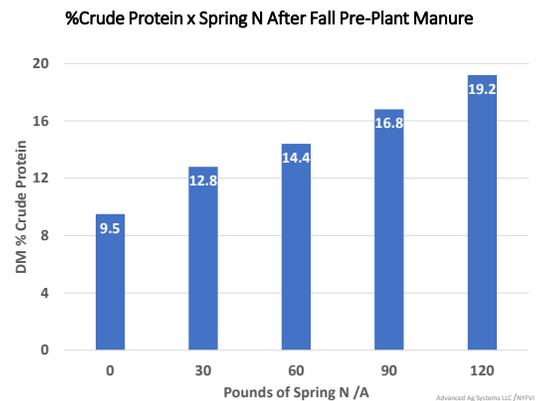
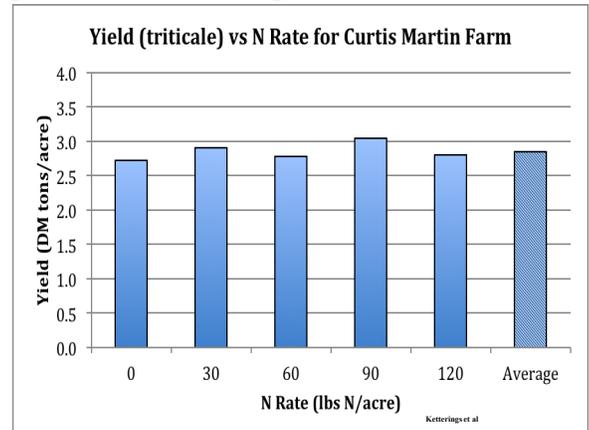
First, maximize the return on the money you spent for fertilizer. Do not apply nitrogen on snow covered ground. It is a prescription for high losses of your investment and low return on the crop. Losses were as **high as 44%** with an average of 26.3% loss when applied to cold or frozen surfaces, especially if they are high in water and/or **have some snow on them.** If you get rainfall or snow **after application** on non-frozen ground, the urea has much less loss. It is highly suggested to add an anti-volatilization agent even under low temperatures in the spring. This will inhibit the urease enzyme from splitting the urea into ammonia that is then could be lost. **Treated urea loss was 63% less** than the untreated in the same field. An anti-volatilization agent in research kept losses under 10%. The addition of an anti-volatilization compound increases the chance of full return on fertilizer money.

With money tight, every bit of fertilizer needs to be working to the maximum. Is your spreader doing a uniform job? There is a big difference as you go from one agribusiness to another in the accuracy and calibration of their spreaders. It is even worse for on farm spreaders that were never calibrated as they came from the builder. Dumping twice as much as needed in one strip and half as much as needed in the other part of the strip is not a prescription for maximum return on your fertilizer. An increasing number of farms who want the money they invested in the crop to go further, are switching to using or hiring sprayers to put on solution nitrogen with sulfur (ammonium thiosulfate) by changing the flood nozzles to stream bars. (www.needhamag.com is one source). This source of nitrogen with significant nitrate form of nitrogen is much more quickly available to the crop. The stream bars allow for higher nitrogen application without burning the crop like a flood jet would tend to do. Western NY Crop Management reports that only on windy days that distort the stream bar flow and produce fines, do they see any burning even at high nitrogen rates.

To get both yield and **protein** from your forage, **crops need sulfur.** There is no longer enough sulfur being deposited in rain to meet the needs of the crops we grow. In my earlier research we found that as the nitrogen increased the crude protein went up but only to a point. On a number of the trials over different years and conditions, the crude protein peaked at about 15 to 16%. When we added sulfur to the spring topdress, or switched to fall preplant manure with its sulfur content critical for protein production, the **forage crude protein increased to 20%.** For a field that has not had manure last fall (a major on-farm sulfur source) it is highly suggested that sulfur be added. A very effective ratio is roughly 1 lb. of sulfur for every 10 lbs. of nitrogen. A mix of 1500 pounds of urea (treated with an anti-volatilization agent) mixed with 500 pounds of ammonium sulfate will give you approximately 40-0-0-6S. This is perfect for **all cool season grasses,** in addition to the winter forage grains such as triticale.

Our multi-year research has shown that for planting on time or slightly late (wheat planting date which is 2 weeks late for winter forage), some nitrogen in the fall can boost tiller production which increases spring yields. Once you get past the optimum date for planting wheat in your area, fall nitrogen starts to be a waste of money for winter forage production. Where we planted on time with **4,000 gallons of manure/acre** immediately incorporated, we **boosted yield** the next spring **14%**. It also boosted the crude protein in the forage at lower spring fertilization levels.

What if we had put on considerable manure before planting winter triticale the previous fall? Do I need to add more fertilizer or is the manure sufficient? We had this same question and with the help of Curtis Martin of Savannah, Dr. Ketterings and her staff, and Advanced Ag Systems, we researched that question. 6,000 gal of hog manure was applied and incorporated an hour after spreading. Triticale was planted September 15, which is just after the optimum window but still early compared to wheat. The following spring Dr. Kettering's staff put in replicated plots of 0, 30, 60, 90, and 120 pounds of nitrogen/acre. The plots were harvested at flag leaf and yield and quality were checked. Interestingly, the yield (see graph at right) which reached 3 tons of dry matter on some of the plots, did not increase with increasing nitrogen. There was no significant difference between the 0 and the 120 pound of nitrogen/acre rate. There was a very clear and significant difference between the nitrogen rates and the **crude protein that resulted**. As can be seen in the second graph at the right, as the nitrogen went from 0 to 120 lbs./n/acre, the crude protein increased from 9.5% to 19.2%. Will it be economical to add nitrogen in the spring if there is no yield increase, but a protein increase? No sulfur is needed because at this manure application rate, it supplies sufficient amounts to meet the needs of the crop. Nitrogen at \$.70/pound spread would cost \$84/acre for the highest 120-pound nitrogen rate. At three tons of dry matter/acre (6,000 pounds) at 9.5% crude protein for the 0 nitrogen rate, it produces 570 pounds of protein/acre. The same three tons would produce 1152 pounds of crude protein/acre at 120 lb.N/A. The difference between the two nitrogen rates is 582 pounds of crude protein for 120 pounds more nitrogen/acre. With soybean meal at 53.5% crude protein on an as fed basis, that is 1088 pounds of soy meal. With soy meal priced (it seems to change by the minute lately) at \$440/ton, the .544 ton (1088/2000) of **soy meal would be worth \$239 for the crude protein produced by the addition of \$84 of nitrogen fertilizer**. If we only got two tons of winter triticale dry matter yield, the additional \$84 of nitrogen fertilizer would generate \$159 of soy meal crude protein. So the bottom line appears to be with fall manure, putting at least 100 pounds of nitrogen on the crop at green up as a suggested rate. If it was planted early and came through the winter in good shape, then 120 lbs. of N/acre would be a reasonable suggestion. Finally, **DO NOT TOP-DRESS YOUR WINTER FORAGE WITH MANURE, YOU WILL REGRET IT. It can wreck the silage.**



Sincerely,

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Hand
to Better
Agriculture**

