



ADVANCED AG SYSTEMS'S

Crop Soil News

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

Getting the Most Forage Getting the Most Out of Your Forage

Now is the time to apply nitrogen. In research and on-farm results, nitrogen TRIPLED the total yearly yields on perennial grasses where it was applied. Crude protein jumped from 15% up to 21%. Nitrogen is critical for maximizing yields of very high quality winter forages such as Triticale. Nitrogen is where you should put your money, especially *if you are short on forage!*



Advanced Ag Systems
Research, Education, Consulting

Getting the most yield from your nitrogen

Some still have the idea that spreading any nitrogen is ok, after all it is cold, what could happen to it? Researchers Dr. R. Engel, Dr. C. Jones, and Dr. T. Jensen, found there are **major losses** even at temperatures **below 40F**. Losses were high when applied to cold or frozen surfaces, especially if they are high in water and/or have some snow on them. The losses were from 8 to 22% in one week. Over the longer 8 -10 week trial the losses were **as high as 44%** with an average of 26.3%. Of the 8 trials, half had losses of >30%. Even with temperatures near freezing, the worse cases were frozen soils with a saturated surface. The surface water dissolves the urea and then as the surface dries, the dissolved urea leaves as a gas instead of attaching to the soil. If you get rainfall or snow after application on non-frozen ground, the urea has much less loss. In their study when they had rain or snow with moisture of $\frac{3}{4}$ of an inch after application, then losses were less than 10%.

As even the weatherman has difficulty some times in getting the 24 hour forecast on target; spreading nitrogen without regard to the weather is a very unprofitable form of gambling. The simple answer is to add an anti-volatilization agent to prevent these losses. Adding an anti-volatilization agent kept losses under 10%. Treated urea loss was 63% less than the untreated in the same field. With nitrogen running \$0.75 or more per pound, the addition of an anti-volatilization compound at full rate is cheap insurance.

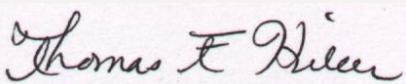
Get the most protein from your nitrogen.

As we are adding nitrogen to get both yield and protein from our forage, you need to be aware of a change that has happened in the past decade. The amount of sulfur being deposited from rainfall has fallen precipitously. In fact, if the field has **not had manure the past year** it is highly suggested that sulfur be added. A suggested rate is to apply 1 lb. of sulfur for every 10 lbs. of nitrogen. Urea mixed with ammonium sulfate will produce a 40-0-0-4S mix. At the Cornell Valatie Research farm in winter triticale where we added 115 lbs. of N/acre as urea, we got 14% crude protein. Right next to it where we added only 100 lbs. of N as ammonium sulfate; the winter forage produced 17 – 18% crude protein. This holds true with all grasses, cool season or the winter forage grains such as triticale. There is an excellent fact sheet at <http://nmsp.cals.cornell.edu/publications/factsheets/factsheet34.pdf> that will give you a quick understanding of sulfur in the plants and in the soil.

Getting manure nitrogen on early with winter tillage.

It is bad enough we came up with winter forages, now we are using winter tillage?? This is a proven practice where using a chisel plow, you slip just under the shallow frozen ground and are able to till it, thus incorporating the manure to reduce volatilization of the nitrogen and loss in surface runoff. The process was developed and researched by Dr. Van Es at Cornell University and has been used by a number of farms to take advantage of the opportunity windows as they opened. You can see a report on this at http://css.cals.cornell.edu/cals/css/extension/cropping-up-archive/wcu_voll1no2_2001a3manureinjection.pdf. The concept is that freezing ground removes liquid water and replaces it with ice. The remaining liquid water moves up to replace the frozen water and it in turn freezes to the bottom of the ice layer on the surface. The whole process gradually dries the remaining soil while the surface is very high (frozen) moisture. Windows open where there is only an inch or so of frozen ground and the soil underneath is friable. Punch a hole through the frozen layer and squeeze the soil to a ball. If it makes a ball it is still too wet. If it crumbles instead, then it is dry enough for frost tillage. It takes about 20% more horsepower to break the frozen ground. Most farmers have switched from the wide 4+ inch twisted shovel shank to the **narrow 2 inch straight shank** for this. It reduces the amount of steel you drag through the ground, but still gives the full shattering and mixing, especially on corn silage fields. After the ground thaws it levels the majority of the lumps out. Level fields of corn silage would be the best targets for uniform soil conditions (on rolling ground, hill tops may be frozen greater than an inch and valleys in sheltered warm sites may not have frost to hold up manure trucks). Keep in mind that you may not do all the fields, but each field you can do is one less you have to do in the rush after spring thaw. The critical point of this extra effort is to get the manure out and incorporated in an environmentally sound manner. Then when the warm weather comes you can plant, rather than waiting to the manure out.

Sincerely,



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Hand
to Better
Agriculture**

