

Crop Soil News



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August 2018

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

Advanced Ag Systems
Research, Education, Consulting

Manure as Fertilizer for Winter Forage Part I

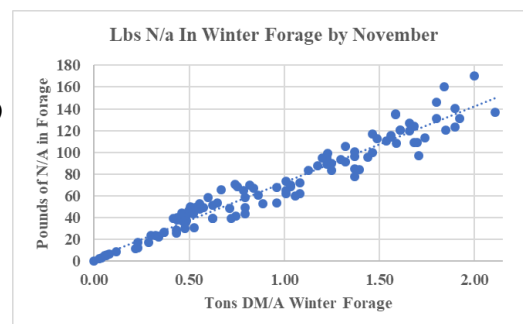
With the fall harvest season, it is time to plant the high quality winter forage that builds soil health while making you money. As discussed in the March issue, crude protein of 18 – 20% is common with proper management and fertilizer (nitrogen & sulfur). Last year Relative Feed Quality was 180 at harvest. Our variety trial averaged 3.5 tons of dry matter (10 tons 35%DM silage) at harvest.

I suggest you read the [August 2017](#) newsletter on the key details for maximizing yield. At this point I do NOT suggest wheat due to its low forage yield. I am hesitant on the new hybrid rye (or especially common rye) due to lodging in our trial this year (will test again this fall). Winter triticale planted correctly, over winters and allows for higher protein with little chance of lodging. Over our 20+ years of research, **planting date** stands out as the **critical point** for nutrient retention, soil erosion control, soil health improvement, superior weed control, significantly improved winterhardiness, earlier harvest next year and **most importantly: yield**. To maximize these benefits **winter forage**, especially triticale, needs to be in the ground 10 days to 2 weeks before wheat planting date for your region.

Research by Dr. Ketterings at Cornell Department of Animal Science found where manure or compost was applied to corn in the spring, it releases nitrate during the growing season and continues to release long after the silage is removed in September. The release stops when soil temperature drops to low for biological activity. This is a major concern as if there is nothing to take up that nitrogen, it could potentially leach into waterways or denitrify, and also a monetary loss for the farm. Spreading manure immediately after corn harvest and before winter is potentially even more problematic as it will rapidly convert it to nitrate and be lost if no vegetation is absorbing it. Multiple studies of winter forage planted on time (10 days to 2 weeks before wheat planting date) captured this nitrogen to produce more tillers that increased the yield potential the next spring, while utilizing left over nutrients to reduce protein purchases and provide the highest quality forage found on farms.

Work at Cornell and Advanced Ag Systems, found "Across all N rates, N uptake ranged from 36 to 78 lbs N/acre and averaged **62 lbs N/acre** for the triticale planted **before September 20**, and ranged from 16 to 20 lbs N/acre with an average of **19 lbs N/acre** for triticale planted **after September 20**. For every ton of DM triticale biomass produced in the fall, approximately 70 lbs of N was taken up. (Lyons et al)"

Planting date was the biggest driver explaining 79 -90% of the total variability of the uptake by winter grains. In my, and Dr. Ketterings, research (graph at right) the more dry matter produced in the fall, the more nitrogen is stored and held over until next spring. A summary of all the research is in the graph at the right. Yes, some of our research saved over 120 lbs. of nitrogen/acre.



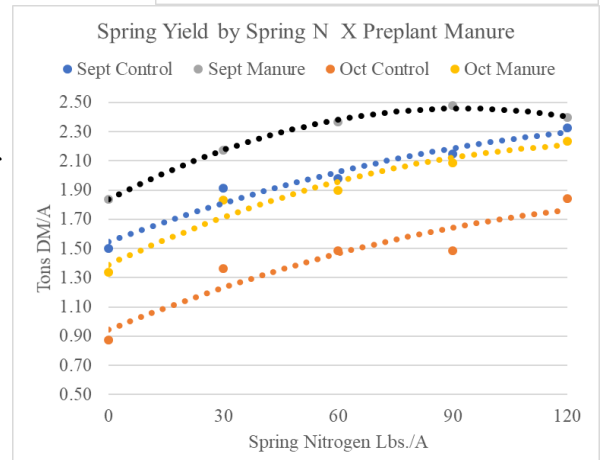
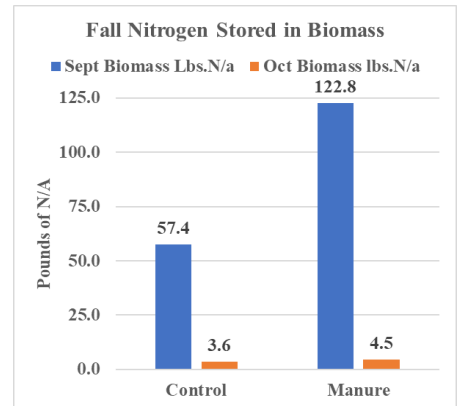
The key factor is WHEN DID YOU PLANT? 10 days to 2 weeks before wheat planting date has shown year after year to give us the best of all the benefits of winter forage. It is like cover crops on steroids.

With support from New York Farm Viability Institute, we have looked closer at utilization of manure for winter forages. Note: planting winter forage on time and getting a significant amount of fall growth (picture at right), and then topdressing unseparated manure is a prescription for potential disaster. Even with winter snow and rain, the dry matter in the manure will stay lodged in the forage crowns to provide inoculant for making **spoiled, unfeedable silage** the next spring. Topdressing in the spring is worse! In addition, surface applications volatilize wasting the majority of the nitrogen in the manure and not benefit the crop.



Topdressing manure in fall or spring on this correctly planted winter forage wastes most of the ammonia nitrogen and can make horrible silage

The graph at the bottom right shows that planting on time and adding 4,000 gal/A manure preplant increased the yield. The later (October) preplant manure application should have a nitrification inhibitor to hold the excess nitrogen in ammonia form until spring as the winter forage will only store a few pounds (graph at right). The bottom line is if we plant on time in September, we can take up and **store in the crop** (graph at right) a considerable amount of **nitrogen** (green manure storage) that normally would be lost to denitrification or leached away. Our trial showed 80% of the field's total nitrogen was held in vegetation for on-time planting. As reported in the March 2018 newsletter, properly applied pre-plant fall manure for winter forage can meet the entire spring nitrogen needs for top yield in the spring. As noted in that letter, it did **NOT meet our forage crude protein** goal of greater than 18% .



The practical problem arises in on-farm application of this system. For optimum results the winter forage needs to be planted as soon as the corn is chopped off. The crew is busy chopping while you are trying to get the manure on and immediately incorporated and the winter forage planted. The other problem is the sheer amount of nitrogen this crop can remove. A commercial variety in our trial harvested in 2018 yielded **3.78 tons of dry matter @19% crude protein** which **removed 230 lbs. of nitrogen/acre**. This far exceeds the amount we can take up and store in the fall. Thus our fall manure rates for a properly planted and growing crop may be to low for both yield and especially quality the next spring. Trying to apply enough for next spring in September preplant will mean it goes into the winter with a large portion in nitrate form which is gone by spring.

A **practical solution and research to back it** will be discussed in the September newsletter: Manure for Fertilizer on Winter Forage, Part II

Sincerely,

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Hand
to Better
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