

# 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  
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## Steps to Maximum Yield with High-quality Winter Triticale Forage

Winter forage triticale planting date is critical to fall nitrogen uptake and its yield benefit. Planted on time for your region, triticale has been shown to take up and store over 100 lbs. of nitrogen. Our New York research found **nitrogen and sulfur as a starter at planting** will give a tremendous yield boost at all nitrogen levels next spring. This is a case of either you have it or you don't. If you are **not planting on time** (two weeks before the wheat date for your region), you will **not get the nitrogen uptake**. Even worse you will **not get the yield** boost the next spring because of the missed earlier planting date and the planting nitrogen. This fall nitrogen has to be spread at planting so the winter forage plants can access it as soon as they emerge.

I am getting a number of questions on the use of manure as the nitrogen source for the fall or for spring fertilization. We have done considerable research on this and found real positives and some **critical disaster negatives**.

We do NOT recommend delaying planting in order to spread manure. Both my research and that of Penn State found you lose more yield than you save on fertilizer by delaying planting for manure application. In NY conditions we found 60 lbs. of starter nitrogen at planting, if planted on time, gave the maximum benefit at all nitrogen benefits the next spring. Surprisingly the nitrogen efficiency was very high when we measured the uptake before the crop went into the winter. If the field had been buried in manure the previous spring and there was a less-than-normal crop removal (dry conditions anyone?) a significant portion of that nitrogen may carry over and meet the fall nitrogen needs.



On time planting (left) is critical to maximize spring yields and response to nitrogen both fall and spring. NY research found that up to 60 lbs. of N in the fall significantly increases yields the next spring. Delaying planting to spread manure first is completely counter productive and reduces yields.

There are a lot of questions and temptations to go out and spread on top of the emerged triticale. **A big mistake.** It turns dark green and lush but is a **disaster waiting in three forms.** First, staying on the surface can lose most of the ammonia in the manure (where a majority of the readily available nitrogen resides) as it volatilizes directly into the

air. Thus, you are short on nitrogen and have applied excess phosphorous and potassium. Secondly, when the ground freezes and you get winter rain, it is a perfect scenario for moving your manure solids and the liquid still on the frozen surface, into the nearest waterway. Again, you are losing fertilizer as even the organic fraction washes away taking the fertilizer with it. A 2% slope can move a lot of water. You lose key fertilizer money while polluting the neighborhood. Third, the absolute **worst problem is the manure that lands on the vegetation**. On a field near my house, they spread on emerged triticale in the late fall (November). I followed it all winter and the next spring there was still solid, semi-solid manure entrained in the vegetation. Manure in the silo is not how you make high-quality forage. One farm that did this had silage that was putrid smelling, and full of maggots. His nutritionist said not to go near the cows with that. He fed it anyway and killed two cows with hemorrhagic bowel syndrome. Not a good move. You may have gotten away with it before but at some point it is going to bite you very hard.



Manure spread the previous November on triticale was still entrained in spring on the forage at harvest. This is counter productivity to quality and can kill cows.

#### There is a role for manure with winter forage.

What we have found was that by injecting the manure in early winter – when the soil had dropped below 50 F and the ground hadn't frozen yet; we were able to meet all the nitrogen and sulfur needs the next spring. It unloads a tremendous amount of manure from storage before you go into the winter. It can be done as a very environmentally sound method. The injected covering keeps the volatile ammonia which then attaches to the soil. In the colder north, our replicated research found all the nitrogen is there in the spring. This is a huge positive savings for you. What we have found in our research, and an increasing number of farms are adopting, is to inject the manure with an angled rolling coulter injector. A rolling coulter takes very little horsepower to pull, and puts the manure 3 – 4 inches in the ground and covers it. The cover eliminates ammonia loss, odors, and runoff removal. In our work we applied 14,000 gal/A at 3 pm, the next morning at 9 am the slot was dry as it all soaked into silty clay soil.



Manure injected (left in picture) when the soil is below 50F but not frozen solid will capture and hold the nutrients until the crop is ready to use them in spring. It unloads manure storage in the off season and saves tremendously on the spring fertilizer bill.

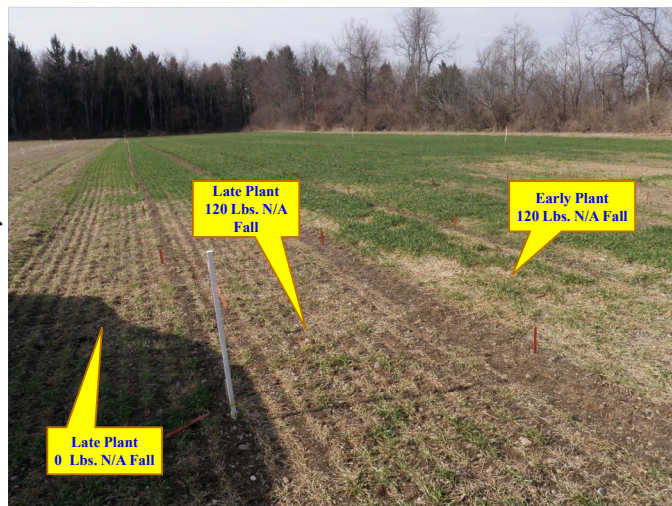
Injecting leaves nothing to be entrained in the silage during the next spring harvest. During our research, a consultant pulled up downwind and he said if he didn't know it was a manure spreader he would have never known we were spreading manure as there was **NO smell**. No smell means you have captured all the ammonia so maximize the use of manure to meet your winter forage fertilizer needs. Depending on the amount of ammonia/1000 gal of manure we have applied anywhere from 12,000 – 20,000 gallons of manure/acre to meet the nitrogen needs of the crop (click on [March 24](#) for amounts needed). You can empty a lot of storage at that rate in an environmentally sound manner.

The ammonia attaches to the soil exchange and remains there until the ground warms to 50 F in the spring. Winter triticale grows at 40F and so as soon as the ammonia becomes available it is taken up by the crop. Because you are injecting it, the winter rain cannot remove it into the waterways. It does not volatilize into the air. With the design of the rolling coulter injectors and the slower speed you need to apply enough

rate/acre, stones are a minimal issue. The closing coultter leaves a smooth field for mowing. I do not suggest knife injectors as they pull up stones, take a lot more horsepower to pull through the field, and leave a rough surface for the mower. An added benefit is that you are injecting when nearly all the fieldwork has stopped. This helps you to balance the workload on the farm. The added benefit of the rolling coultters is that after the winter triticale forage is harvested you can reinject more manure to meet the needs of the following no-till planted corn crop. I suggest all farms with liquid manure add coultter injection to their spreader. We often paid for coultter injectors in one year of fertilizer savings.

**Planting early with starter nitrogen to boost fall growth will NOT produce excess growth that winter kills.** We clearly saw that in multiple, replicated planting date/nitrogen trials. What you have to worry about under certain field conditions is snow mold which can kill or seriously damage the crop. As you can see in the picture at top right there are three plots. On the left is a late plant with no additional nitrogen. The second middle plot is late planted with additional nitrogen. On the right is early planted with additional nitrogen. All three were killed by snow mold because that is where the meltwater lay.

The bigger plants (planted early or on time with fall nitrogen) are usually more successful at staying above the water and growing out of the mold. The long-term weather forecast is that this winter will be warmer and moist. For the northern areas that means snow. Snow is not a problem. When the snow melts on frozen grounds and makes large puddles or ponds in the low areas, that is when snow mold becomes an issue. The spores travel in the water and infect and kill the plant. It is acerbated by continual snow cover that uses up reserve carbohydrates in the plant, making it more susceptible to infection. It has very little to do with when you plant or how much nitrogen you put on. For flat or pocketed fields that turn into small ponds in the winter thaws, you can fertilize those areas by spraying with liquid sulfur fertilizer and a spreader sticker in late November just before the snow. This fertilization has stopped the snow mold. (Note: this is a fertilizer recommendation, not a pesticide recommendation in case anyone asks). Based on information from Canada, we had research with the Western NY Crop Management Association. We fertilized with Max-N sulfur at the 2-quart rate applying about 0.7 to 0.75 of sulfur as liquid as it had better coverage which made a difference. The spreader sticker increased the fertilizer effect on snow mold. **YOU ARE APPLYING SULFUR FERTILIZER IF ANYONE ASKS.**



Early planting and fall nitrogen do NOT increase or cause snow mold. The left was no nitrogen and planted late. The middle was late planted with high fall nitrogen. The right was early planted with high fall nitrogen. Snow mold occurred where the meltwater ponded on the frozen ground.



There is a genetic range of susceptibility to snow mold. Variety trials uncover this and vulnerable ones are pulled from the seed line. Some marketed varieties are not tested and can impact your yields.

Sincerely,

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