



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."

Aeration Tillage Part II, Control odor & save \$50/acre

In the last issue we discussed the use of aeration tillage for rapid establishment of new legume seedings. It is also used to prepare the soil for conventional drilling small grains. Where interest has really taken off is its use to capture more of the nitrogen in the manure without subsequent soil erosion while simultaneously dramatically reducing the smell effect that has neighbors up in arms.

Several researchers have found that immediate aeration tillage can capture of the ammonia form of nitrogen that makes up half the total nitrogen in manure. This is normally lost unless incorporated immediately after spreading. The problem is that conventional tillage is too slow to keep up with the spreaders. An additional major problem has been that you can spread earlier in the spring than the soil is ready for conventional tillage. Aeration is shallow so does not need the deeper layers friable to work it without damaging the soil. A disk would simultaneously leave a smear pan and bring up stones.



Pict #1



Pict #2

Brian Chittenden (Dutch Hollow Farm, LLC 518-376-8397), found that in the spring, when the ground was just too wet to spread and immediately incorporate, a single pass with the aerator set at light (3% angle) dramatically increased the drying rate (assuming a normal drying day – this isn't magic, overworking wet soil compacts it). The next day they were able to spread on their clay soils without sliding off the field, and to make a second pass with the aerator to incorporate the N and save \$50/acre without having to work wet soil.

A two year study on his farm by Dr. Ketterings of Cornell University, and **Advanced Ag Systems**, found that spreading and immediately aerating at a 10 degree angle gave the same nitrogen capture as did chisel plowing. This captures more than 100 lbs of nitrogen worth about \$50/acre. The cost of running the aerator is \$8.06, slightly less than a disk. *Caution: keep in mind that this nitrogen can be substantively lost if there is excessive rain and saturated soil before sidedressing time.*

A farm that has moved this capture of manure to a very low cost, very high efficiency, is Mark Anderson and Rody Walker at LandView Farms 518-369-8216. In the pictures (#1,2,3), each of his trucks or manure spreader has a mounted or trailing aerator that incorporated the manure from a diffuser directly in front of the tine – a quick, one pass system. The picture #3, shows the diffuser in the back but they quickly learned that it needs to be in the front. As you can see in picture #4, the dark colored area on the left is spread behind the aeration tines. The manure is losing nitrogen and smell is spreading through the neighborhood. The pass at the right was applied in front of the tines, capturing the ammonia and nearly all of the



Pict #3



Pict #4

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smell.

Mark reports a MAJOR advantage of the system is that the manure is spread uniformly like fertilizer. With their every other year soil testing of ALL fields, and manure spread on all but 200 of the over 1,000 acres of corn, he reports major reduction in fertilizer cost yet consistently increasing yields. With the addition of one pass deep zone tillage to remove compaction, his cost has gone down and yields have shot up further in spite of adverse weather in 2009.

Matt Cannon's (518-852-1137) has manure storage and as soon as the manure is spread, he captures the nitrogen with a pass of the aerator with drag fingers and rolling basket. On a field that had received 8,000 gallons of manure/acre for the past three years, we calculated that he was applying 80 – 100 lbs of nitrogen/acre in the top 3 inches, just before planting. He then planted with NO starter N. Where he is standing the two rows in the photo had 40 lbs of N applied as a starter band and there was no difference in growth or yield where he applied no starter nitrogen. The key is prior soil test, spring application and immediate shallow incorporation. This is not for daily spread.



Pict #5

Matt has taken it a step further in that after incorporating his manure he comes back and no-tills his corn. As you can see by the picture he is able to get excellent stands. Growth is very good because the soil is loosened enough to get

good seed soil contact but not overworked to destroy soil structure and organic matter.

There are a couple of key steps. The planter needs to be set up correctly – we ran into issues with too much down pressure on the closing wheel. Just running an aerator over the field will leave a series of holes. Work in the mid west found that the planter then dropped the seed into that 5 – 7 inch hole and so gave very poor, erratic stands. Matt has the finger drag and rolling basket behind to fill the holes with loose soil and allow for better stands. The use of a wide wave 3 coulter set for zone or strip tillage on



Pict #6

the planter would do an even better job.

At Matt's we found an additional advantage of the aeration tillage in picture #7. During the season the holes between the rows will stay and when heavy downpours occur they capture that runoff and channel it deep into the soil. This provides moisture for higher and more consistent yields. As the same time the aeration tillage surface provides critical conduit for oxygen when we have excessive rainfall. This pocketed surface also reduces erosion of the most fertile part of your soil by reducing runoff and capturing silt. All of this without overworking the soil (burning up organic matter / destroying structure), not bringing up stones, and very low cost/acre.



Pict #7



Pict #8

Aeration tillage is not magic. Aeration tillage will not help underarm wetness or improve your sex life. It will not instantly fill your checkbook or milk tank. It is one tool in your toolbox that has the potential to reduce the cost of producing milk and possibly speed your crop planting system.

Not all aerators are yellow, another company makes a slightly different knife for a blue machine. There is also a red version. You have to decide which is for you.

Sincerely,

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Hand
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