THE LEADING EDGE

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A PUBLICATION DEDICATED TO MAXIMIZING YIELD POTENTIAL

New Age Anhydrous

The days of relatively inexpensive fertilizer and carefree application are long gone. Today's producers are struggling to balance environmental concerns, time management, rising fertilizer costs, and, until recently, a lack of equipment that met the needs of no-till production systems.

The Way NH3 Used To Be

One of the most widely used fertilizers, ammonia (NH3) has been traditionally applied in the fall when the weather is more likely to be favorable and producers are not facing the pressure of spring planting. The methods of application varied, but with low fertilizer prices producers tended to select the easiest and least expensive application option.

Traditional NH3 application has been to pull a knife through the ground, leaving a field heavily disturbed and needing additional work before planting.

In the past this meant using large equipment— liquid application demanded big shank applicators on hefty toolbars or planters and granular application required heavy spreaders. Both these options meant big tractors with major horsepower were required to make it through the field, and extra horsepower meant fuel bills added up.

Because NH3 was (and remains) a relatively inexpensive form of nitrogen, producers tended to apply liberally—an insurance policy against unpredictable distribution due to equipment shortcomings and fertilizer loss over the winter.

Residue disturbance caused by heavy equipment has been an additional drawback. A study completed by Iowa State University, based on NH3 application equipment typical of the time, found that as much as 50 percent of the soybean residue cover and as much as 40 percent of corn residue was destroyed after application equipment passed through the field.[1]

[1] http://www.extension.iastate.edu/newsrel/1999/nov99/nov9903.html

The loss of this residue in the fall meant that fields were exposed to erosive wind and water for several months. This much disturbance and potential for erosion meant a fall NH3 application virtually robbed that field of a place in

the no-till category.

A New Look at NH3 Application Tools

Today, as fuel costs and fertilizer prices—NH3 included—continue to skyrocket, growers are scrutinizing every input dollar and searching for ways to keep costs down. NH3 remains the least expensive form of nitrogen, and no-till farmers are seeking application tools that effectively apply ammonia and still maintain the no-till environment. Effective use of every drop of ammonia is the goal.

In Kansas, wheat farmers get good results from injection systems consisting of a single disc opener followed by a thin knife. No-till corn growers are searching for similar setups that can replicate those results in fields with tougher conditions, wider row spacing, and crops that require a higher volume of NH3.

Manufacturers are developing units that cause less soil disturbance than older versions— a challenge because less soil disturbance usually means more sealing challenges. New advancements in coulter technology have resulted in coulters that do not use traditional knives. Instead these units are running a coulter blade on an angle while keeping the fertilizer distribution tubes inside the shadow of the blade. This creates a very narrow application zone. The angled coulters cause less disturbance and require less horsepower to operate, allowing growers to cover more acres in a shorter amount of time.

Accuracy in metering is also a goal for new NH3 application tools. This has been a challenge in the past because the gaseous nature of the chemical—it has a low boiling point—results in both gas and liquid being applied to the soil. However, only the liquid NH3 could be measured by most metering devices. New delivery systems meter each row more accurately, leaving producers confident that they have applied the intended amount of fertilizer in the correct location.

Some applicator systems now include super-coolers to keep the NH3 in a liquid form. Others incorporate pumping systems to keep the NH3 under pressure. Either method insures more accurate metering and leaves a higher portion of the NH3 in liquid form when it reaches the soil. A higher percentage of liquid ammonia means much more accurate metering and application, making the fertilizer investment more productive.

Other new equipment options include larger supply tanks and more sophisticated trailers. One thousand gallon tanks are being replaced with 1,450-gallon tanks; 2,000-gallon tanks; twin 1,000-gallon tanks; or even twin 1,450-gallon tanks. Old, standard running gear is being replaced by larger-tired, four wheel-steer carts to carry the loads.

New NH3 wagons have increased capacity while lowering compaction.

These tracking wheel systems result in less soil compaction and follow the applicators more accurately. Bigger machines are boosting productivity by requiring less downtime without increased soil compaction or other drawbacks normally associated with an increase in capacity.

Add Technology to Maximize NH3 Efficiency

At one time, for many producers, the cost of variable rate technology was too high to be offset by potential fertilizer savings and yield gains. With increasing input costs, however, the point of return-on-investment is much more foreseeable, even for medium sized operations.

Studies support variable rate technology and its ability to increase input efficiency. A recent study conducted by Ohio State University tested three different methods of applying fertilizer at variable rates using precision agriculture equipment. Although the applied nutrients were potassium and phosphorous, a variable-rate application plan is advantageous in the application of ammonia as well. The study compared application with precision technology to the farmer's normal production practice and no use of precision agriculture equipment. All three variable-rate methods resulted in fertilizer savings ranging from $36 to more than $88 per acre.[2]

[2] http://extension.osu.edu/~news/story-print.php?id=4553

Most variable rate systems involve integrating a computer chip with the applications system. A computer then varies the application rate of the fertilizer based on data supplied by another handy piece of technology, a yield monitor. This tool assigns a number to nutrient levels that farmers must otherwise judge based only on observation and known soil history.

New NH3 application tools have lowered soil disturbance and horse power requirements while increasing productivity.

For ultimate accuracy and efficiency in applications, auto-steer systems are another technology worth exploring.

They help eliminate overlap and skips, and many can accurately guide driving down to the inch.

An Investment in NH3 Efficiency is Future-Focused

With no end in sight to rising fertilizer costs, producers are looking to change the NH3 application game. Although the last 50 years has seen very little advancement in NH3 handling options, with new products on the market today, that is changing. No-till farmers who may have been dissatisfied with application options in the past should consider re-evaluating the NH3 options based on the new technology, updated equipment, and dedication by manufacturers to build the right solutions. Efficiency in all aspects of

production is vital in today's agriculture environment. Producers will discover a valuable return-on-investment when they research new options and invest in new equipment.

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